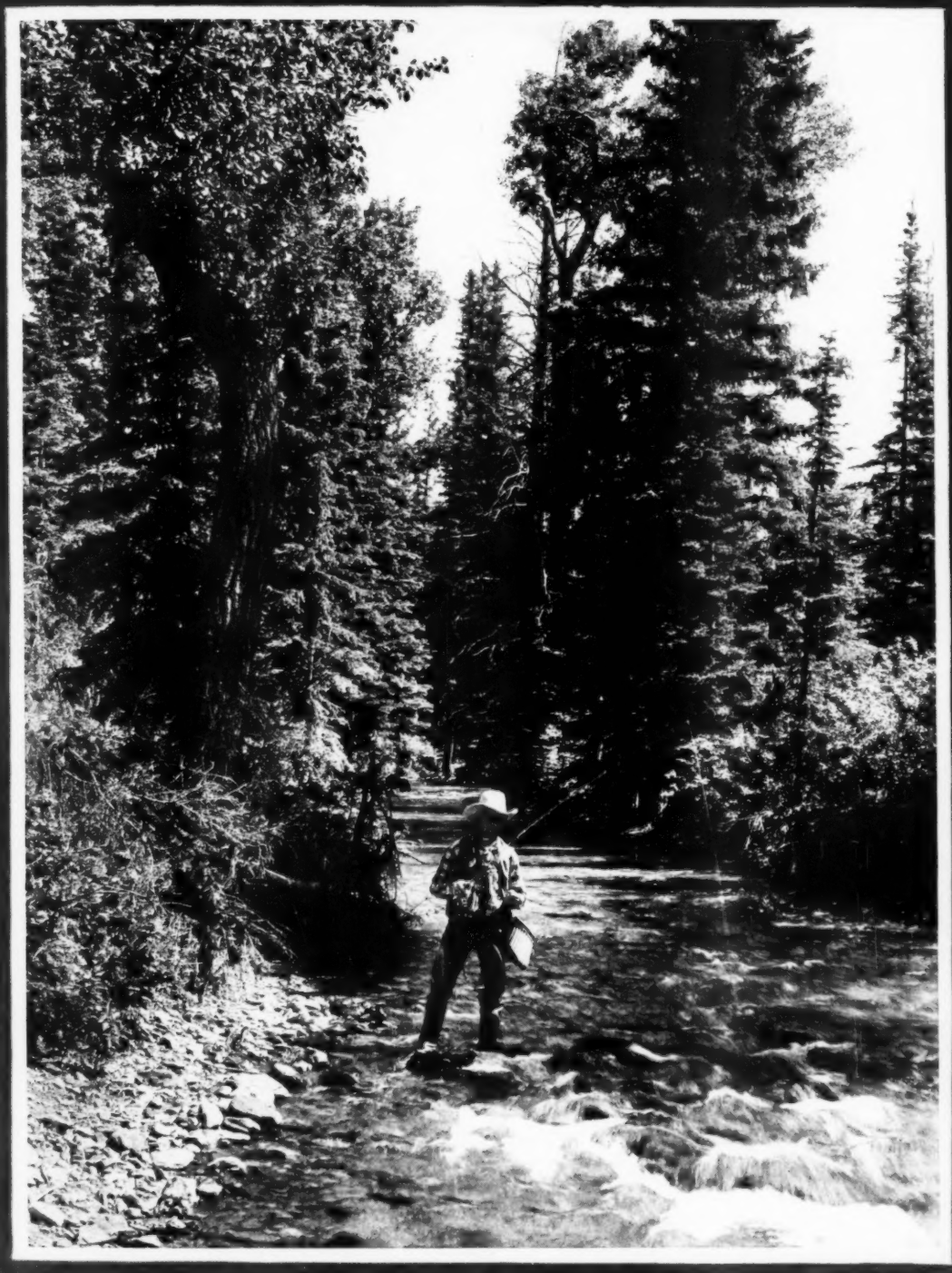
AMERICAN FORESTS



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EDITOR
Ovid Butler

ASSOCIATE EDITORS
Lilian Cromelin
Erle Kauffman

COMING

Here is a preview of some of the outstanding articles scheduled for the summer: In the July issue—"I Wanted to Herd Cattle," by Grace Ernestine Ray; "The Joyce Kilmer Memorial Forest," by Charles Newton Elliott; "Beauty and the Insect," by Myrtle Broley; "Experiment in Land Planning," by Marion Gold Foster; "High Country Trout," by Claude M. Kreider; "Wildlife in Gotham," by Lorine Letcher Butler and others.

In the August issue—"Filming the Golden Eagle," by Alfred Bailey and C. N. Neidrich; "The Tree That Changed a Country's Name," by Mrs. H. E. Parry; "Primitive Forests," by Allan F. Matthews; "Treasures of the High Sierra," by Ethel Severson; "Looking Backward on Logging," by Newell L. Wright; "Green Gardens," by Devereux Butcher; "Charles Kellogg—Bird Man," by Marguerite N. Davis; "From Nut Coal to Nuts," by John W. Spencer; and others.

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The Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. All manuscripts should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles . . . . Notice of change of address for AMERICAN FORESTS should be received by the tenth of the month preceding issue.

Member A. B. C.

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READERS' FORUM

Special Forest Fire Prevention Issue of American Forests Attracts Wide Comment

The April issue of AMERICAN FORESTS —the special number devoted to forest fire prevention and protection—has attracted such wide public and official comment that publication here of extracts from a few of the letters received by the Editor should be of vital interest to all conservationists.

From *Dr. John C. Merriam, of the Carnegie Institution of Washington:* "I have seen the forest fire prevention number of AMERICAN FORESTS and consider it a very fine contribution."

From *Representative Wall Doxey of Mississippi:* "Scarcely a day has passed since the magazines were received but what several members of Congress have come to me and personally told me that they read our articles ('Fire or Forestry —the South's Great Problem,' by Representative Doxey, and 'Forest Fires—Challenge to Federal Leadership,' by Senator Charles L. McNary) and enjoyed them very much. They spoke very highly of the magazine and all said they had received a great deal of valuable information from it. I think they are really becoming forest-fire-protection conscious and I believe this April issue of AMERICAN FORESTS is doing a lot of missionary work and accomplishing a great deal of good."

From *L. Noel Booth, editor of "Camping World":* "I wish to compliment you on your fire prevention issue, and I wish it were possible that all my readers were able to understand clearly what the fire hazard is. This summer a little less than 2,000,000 youngsters will be going to children's camps, a great proportion of whom have no real background for outdoor life. The page illustration (Six Rules for Preventing Fire in the Forests) of this issue seemed to me to be an excellent reminder to put before our readers who will direct the activities of these campers, and I would like to republish it. We will advocate its being posted on every camp bulletin board."

From *F. A. Silcox, chief of the United States Forest Service:* "I want you to know how much I have enjoyed reading the special forest fire prevention issue of AMERICAN FORESTS. It is a fine job and truly reflects the spirit and ability of the staff of The American Forestry Association. We, of the Forest Service, are proud to have been of assistance by furnishing some of the material in this number."

From *John Edison Mitchell of New York City:* "I received your constructive special fire prevention number of AMERICAN FORESTS the other day and somehow I feel that I cannot find the right words to compliment you on this issue. It is one of the most intelligent, concise, and educational forest magazines that I have seen in a long while. If this issue does not give the American public the will to prevent and control forest fires, then nothing will. I for one shall certainly do my part in trying to interest others."

From *James Stevens, West Coast Lumbermen's Association:* "It seems to me that forestry and the forest industries have never been rendered a more important service in the field of publicity and public information than the articles and pictures you have put between the covers of the April issue of AMERICAN FORESTS. In fact, it is a truly national service you have performed, as every individual in the country really has a stake in the protection of forests from fire. Heartiest congratulations on a magnificent job."

From *Franklin H. Wentworth, director of the National Fire Protection Association:* "The members of our staff unite with me in the warmest possible commendation of your April issue. It is strikingly impressive in matter and in manner and beautifully artistic besides. You are to be thoroughly congratulated on this production and we would wish for it a very wide circulation among people competent to realize the gravity of the hazards it points out."

From *Representative William Nelson of Missouri:* "Never have I seen a worthy cause more ably presented. I would add that preservation of our forests should be a matter of interest to all."

From *George C. Mason of Hampton, Virginia:* "I would like to express my appreciation of your forest fire issue of AMERICAN FORESTS which I feel is worth the whole year's subscription price. I only wish that it might be put into the hands of the people who need it most, the ignorant, poorer whites and negroes who ravage our Tidewater Virginia woods and roadsides every spring with fires deliberately set to 'clean up the woods.' It is heartening to read what is being accomplished in building up a hatred of woods-burning in the deep South, and it encourages me to make greater efforts to reach these people through articles in our local newspapers."

From *Mrs. Charles Cyrus Marshall, president of the National Life Conservation Society:* "I write to congratulate you on the forest fire number of AMERICAN FORESTS. Every article in it is splendid."

From *John H. Baker, director of the National Association of Audubon Societies:* "Just a line to express appreciation of the contribution to intelligent conservation which you have made through the publication of your special forest fire prevention number of AMERICAN FORESTS."

From *H. O. Lathrop, Department of Geography, Illinois State Normal University:* "This issue is so valuable in the study of forest fires that I feel that I must have a copy for my files. I think you are doing a real service by featuring some major problem of this sort. I hope that future issues may deal in a similar manner with other vital problems."

From *William L. Kier of Pittsburgh, Pennsylvania:* "Congratulations for the fine April edition of your magazine. Every American citizen, whether interested in forestry or not, would be sure to enjoy this wonderful edition."

From *H. H. Bennett, chief of the federal Soil Conservation Service:* "I sincerely hope that this very comprehensive and effective symposium on the forest fire problem will reach a wide reading public. Arrangements are being made to purchase 100 copies which will be sent to our regional conservators, state coordinators and others occupying key positions."

From *Walter B. Jones, director of the Alabama Department of Conservation:* "I wish that tremendous message could be placed in the hands and hearts of every citizen in this nation. It is timely and exceedingly well done. While the distribution of your magazine is naturally limited, it is my hope that all of us who have received copies will take up the banner and go forth among men. Certainly we here in the Department of Conservation of the State of Alabama intend to do just that."

From *Floyd A. Johnson, of the Western Cartridge Company:* "I was so impressed with the vivid and accurate portrayal of the destructiveness of fire in cur forests as you have presented it to the American public in your April issue that I cannot refrain from complimenting you. Every school, from the most lowly backwoods to the greatest university should have and should read this issue."

From *Arthur Gibb Draper of North Creek, New York:* "To my mind the April issue is more informative than a whole library on forest fires. It should do a tremendous amount of good in preventing fires."

From *Roderic Olzendam, Weyerhaeuser Timber Company:* "I would like to congratulate you upon the issue of your magazine on forest fires. I think the cover is most effective. I am wondering if you did anything about having this enlarged, in the form of a poster, with a few salient facts on fires underneath it? I am enthusiastic about it and would like to see it widely used, certainly throughout this region of the country."

From *Jack How, Caterpillar Tractor Company:* "Congratulations on your fire prevention issue. Surely this is one of the most convincing documents on this subject ever published."

From *Tom B. W. Watkins of Harriman, Tennessee:* "Without doubt your April issue is the best yet produced—it focuses all attention on the very heart of our conservation problem. I am a district forester in the Tennessee Division of Forestry and plan rotating two of my copies around my forty district wardens—allowing each man ten days' use. Another copy will be placed in our town library and next fall I'll place another copy in the town school. Again many thanks for this splendid issue."

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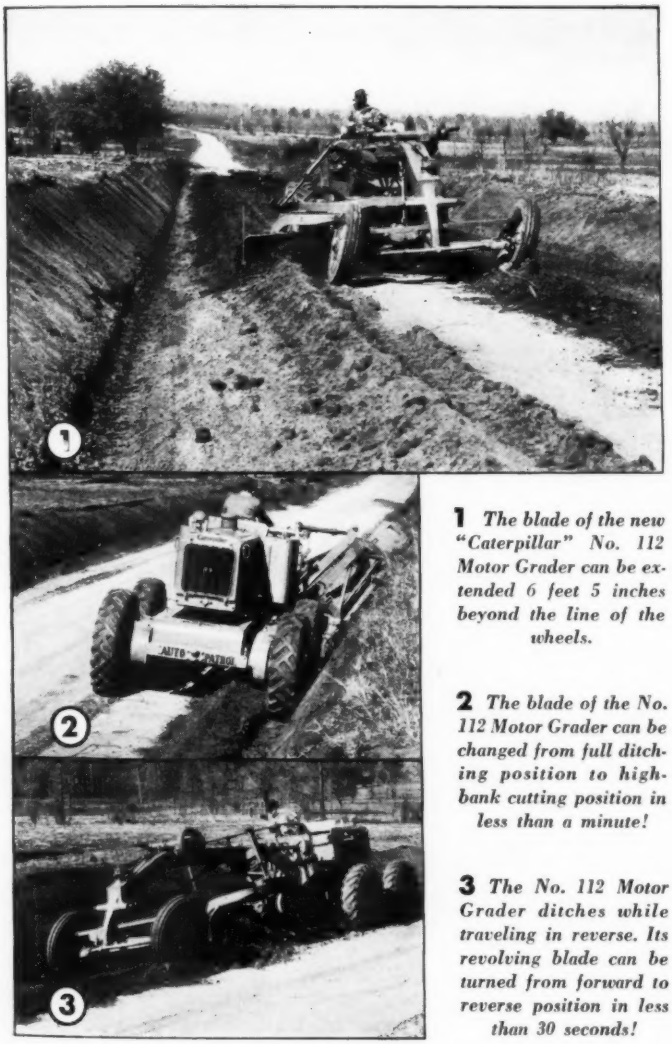

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REORGANIZATION

PRESIDENT ROOSEVELT'S second reorganization order, submitted to Congress on May 9, touched conservation at two points—the Biological Survey of the Department of Agriculture and the Bureau of Fisheries of the Department of Commerce. The order calls for the transfer of these two bureaus to the Department of the Interior. Three days after its submission to Congress, the Senate voted down a strategy resolution by Senator Byrnes disapproving the order and thereby in effect made the order undefeatable and as good as effective at the expiration of the sixty days it must lie before Congress. This date is July 8 unless Senator Byrnes is successful in carrying through his announced plan of shortening the period.

Final though the action by the present Congress appears to be, time only will prove if this placement of the Biological Survey and the Bureau of Fisheries is in the interests of efficiency, economy and the general welfare of conservation. The action goes contrary to the principle of conservation organization for which The American Forestry Association has long stood. This principle briefly is that federal activities having to do with the production and conservation of plants and forests serviceable for soil and water protection, wood fiber and other plant products and of domestic stock and wildlife whose management depends upon plant foods and environment should be under a common administrative agency and that this agency should be the Department of Agriculture.

The work of the Biological Survey has to do with the management and propagation of animals. That obviously is the purpose and function of the Department of Agriculture. There is no biological difference between a wild duck and a tame duck or between a wild sheep and a tame sheep. The best management of both will be that based upon the application of biological knowledge of animal life and plant life. Determination and application of such knowledge is the primary function of the Department of Agriculture and the Biological Survey is one of its scientific arms. The same general principle applies to the Bureau of Fisheries which is a scientific bureau that deals with fish life, which is animal life, and therefore its place is properly in the Department of Agriculture.

The President's grounds for the recommendation appear to be that the Survey should go to Interior because that Department handles the public domain. These grounds have little solid substance to support them. In the first place the national forests and wildlife refuges now in the Department of Agriculture embrace an area virtually as large as that of the public domain under the jurisdiction of the Interior Department. Furthermore, the national forests and wildlife refuges contain the bulk of the wildlife found on public lands today. Interior's public domain by and large is the worst domain for wildlife in the United States. It has been so over-grazed and devastated by past years of misuse that wildlife is more often than not conspicuous by its absence.

This is starkly shown by a recent inventory of wildlife in this country. As an example, the inventory shows that seventy per cent of the mule deer, whose natural range is in the public land states of the west, are on the national forests and less than thirteen per cent on Interior's public domain. As for elk, the census shows seventy-nine per cent are on the national forests and less than two per cent on Interior's public domain.

The Biological Survey was not created to confine its work to public lands in the west. It was created to service the farmers and the public generally throughout the country in respect to birds and wild animals in their relation to crops and people. It will be

a surprise to many that the bulk of the wildlife population in this country is on the farms. The records of hunting license sales show that of the 6,850,000 licenses issued last year only thirteen per cent were in the public land states of the west, while seventy per cent were in the farming areas of the middle west and the east where there is no public domain. As a hitching post for national wildlife management, therefore, the public domain is largely a desert mirage.

As for the claim that moving these bureaus into the company of the public domain across the river from wildlife's principal domain will make for greater efficiency and economy, clear reasoning appears again to have gone into reverse. The mere lifting of a bureau from one department building to another, particularly when the latter is more remote from the bureau's real field of work, does not ring true in tones of public efficiency and economy. The theory in this case has about as much to support it as would a proposal to transfer the New York City Health Department across the river to Jersey City. Efficiency would be handicapped and economy achievable only by curtailing activities. Certainly the Interior Department has no proven magic in the arts of efficiency and economy not possessed by Agriculture.

In the light of the apparent inconsistencies of the order as it relates to conservation, what is the ultimate purpose of the President? To many the present action is interpreted as a prelude to further emasculation of the conservation work of the Department of Agriculture. This view is strengthened by the President's implication in his message to Congress that his next order may deal with the Forest Service. Obviously the present proposal and the quick action by Congress to prevent its defeat has all the earmarks of administrative strategy to "black out" public discussion of its merits and to circumvent the known opposition of millions of conservationists who last year protested against dismembering the conservation work of the Department of Agriculture. The strategy, it would appear, is to disseminate opposition by piecemeal moves and accomplish in the end so far as conservation is concerned what the Administration was unable to accomplish with its omnibus reorganization bill last year.

Ovid Butler

Editor.

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The pattern of the rural landscape, says the author, should have a certain wholeness in order to prove that conservation pays certain dividends. Land must be devoted to woods, marsh, pond, prairie or just scenery to meet economic or semi-economic needs and make the picture complete

THE FARMER AS A CONSERVATIONIST

By ALDO LEOPOLD

Drawings by B. C. Jorns

CONSERVATION means harmony between men and land.

When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one or the other grows poorer, we do not.

Few acres in North America have escaped impoverishment through human use. If someone were to map the continent for gains and losses in soil fertility, waterflow, flora, and fauna, it would be difficult to find spots where less than three of these four basic resources have retrograded; easy to find spots where all four are poorer than when we took them over from the Indians.

As for the owners, it would be a fair assertion to say that land depletion has broken as many as it has enriched.

It is customary to fudge the record by regarding the depletion of flora and fauna as inevitable, and hence leaving them out of the account. The fertile productive farm is regarded as a success, even though it has lost most of its native plants and animals. Conservation protests such a biased accounting. It was necessary, to be sure, to eliminate a few species, and to change radically the distribution of many. But it remains a fact that the average American township has lost a score of plants and animals through indifference for every one it has lost through necessity.

What is the nature of the process by which men destroy land? What kind of events made it possible for that much-quoted old-timer to say: "You can't tell me about farming; I've worn out three farms already and this is my fourth"?

Most thinkers have pictured a process of gradual exhaustion. Land, they say, is like a bank account: if you draw more than the interest, the principal dwindles. When Van Hise said "Conservation is wise use," he meant, I think, restrained use.

Certainly conservation means restraint, but there is something else that needs to be said. It seems to me that many land resources, when they are used, get out of order and disappear or deteriorate before anyone has a chance to exhaust them.

Look, for example, at the eroding farms of the cornbelt. When our grandfathers first broke this land, did it melt away with every rain that happened to fall on a thawed frost-pan? Or in a furrow not exactly on contour? It did not; the newly broken soil was tough,

resistant, elastic to strain. Soil treatments which were safe in 1840 would be suicidal in 1940. Fertility in 1840 did not go down river faster than up into crops. Something has got out of order. We might almost say that the soil bank is tottering, and this is more important than whether we have overdrawn or underdrawn our interest.

Look at the northern forests: did we build barns out of all the pineries which once covered the lake states? No. As soon as we had opened some big slashings we made a path for fires to invade the woods. Fires cut off growth and reproduction. They outran the lumberman and they mopped up behind him, destroying not only the timber but also the soil and the seed. If we could have kept the soil and the seed, we should be harvesting a new crop of pines now, regardless of whether the virgin crop was cut too fast or too slow. The real damage was not so much the overcutting, it was the run on the soil-timber bank.

A still clearer example is found in farm woodlots. By pasturing their woodlots, and thus preventing all new growth, cornbelt farmers are gradually eliminating woods from the farm landscape. The wildflowers and wildlife are of course lost long before the woodlot itself disappears. Overdrawing the interest from the woodlot bank is perhaps serious, but it is a bagatelle compared with destroying the capacity of the woodlot to yield interest. Here again we see awkward use, rather than over-use, disordering the resource.

In wildlife the losses from the disordering of natural mechanisms have, I suspect, far exceeded the losses from exhaustion. Consider the thing we call "the cycle," which deprives the northern states of all kinds of grouse and rabbits about seven years out of every ten. Were grouse and rabbits always and everywhere cyclic? I used to think so, but I now doubt it. I suspect that cycles are a disorder of animal populations, in some way spread by awkward land-use. We don't know how, because we do not yet know what a cycle is. In the far north cycles are probably natural and inherent, for we find them in the untouched wilderness, but down here I suspect they are not inherent. I suspect they are spreading, both in geographic sweep and in number of species affected.

Consider the growing dependence of fishing waters on artificial restocking. A big part of this loss of toughness inheres in the disordering of waters by erosion and pollution. Hundreds of southerly trout streams which once produced natural brook trout are stepping down the ladder of productivity to artificial brown trout, and finally to carp. As the fish resource dwindles, the flood and erosion losses grow. Both are expressions of a single deterioration. Both are not so much the exhaustion of a resource as the sickening of a resource.

Consider deer. Here we have no exhaustion; perhaps there are too many deer. But every woodsman knows that deer in many places are exterminating the plants on which they depend for winter food. Some of these, such as white cedar, are important forest trees. Deer did not always destroy their range. Something is out of kilter. Perhaps it was a mistake to clean out the wolves; perhaps natural enemies acted as a kind of thermostat to close the "draft" on the deer supply. I know of deer herds in Mexico which never get out of kilter with their range; there are wolves and cougars there, and always plenty of deer but never too many. There is substantial balance between those deer and their range, just as there was substantial balance between the buffalo and the prairie.

Conservation, then, is keeping the resource in working order, as well as preventing over-use. Resources may get out of order before they are exhausted, sometimes while they are still abundant. Conservation, therefore, is a positive exercise of skill and insight, not merely a negative exercise of abstinence or caution.

What is meant by skill and insight?

This is the age of engineers. For proof of this I look not so much to Boulder Dams or China Clippers as to the farmer boy tending his tractor or building his own radio. In a surprising number of men there burns a curiosity about machines and a loving care in their construction, maintenance, and use. This bent for mechanisms, even though clothed in greasy overalls, is often the pure fire of intellect. It is the earmark of our times.

Everyone knows this, but what few realize is that an equal bent for the mechanisms of nature is a possible earmark of some future generation.

No one dreamed, a hundred years ago, that metal, air, petroleum, and electricity could coordinate as an engine. Few realize today that soil, water, plants, and animals are an engine, subject, like any other, to derangement. Our present skill in the care of mechanical engines did not arise from fear lest they fail to do their work. Rather was it born of curiosity and pride of understanding. Prudence never kindled a fire in the human mind; I have no hope for conservation born of fear. The 4-H boy who becomes curious about why red pines need more acid than white is closer to conservation than he

Public aids to better private land use will accomplish their purpose only as the farmer matches them with his skill. Can a farmer afford *not* to devote land to fencerows for the birds, to snag-trees for the coons and flying squirrels—can he afford to overlook these human qualities requisite to better land use?

who writes a prize essay on the dangers of timber famine.

This necessity for skill, for a lively and vital curiosity about the workings of the biological engine, can teach us something about the probable success of farm conservation policies. We seem to be trying two policies, education and subsidy. The compulsory teaching of conservation in schools, the 4-H conservation projects, and school forests are examples of education. The woodlot tax law, state game and tree nurseries, the crop control program, and the soil conservation program are examples of subsidy.

I offer this opinion: these public aids to better private land use will accomplish their purpose only as the farmer matches them with this thing which I have called skill. Only he who has planted a pine grove with his own hands, or built a terrace, or tried to raise a better crop of birds can appreciate how easy it is to fail; how futile it is passively to follow a recipe without understanding the mechanisms behind it. Subsidies and propaganda may evoke the farmer's acquiescence, but only enthusiasm and affection will evoke his skill. It takes something more than a little "bait" to succeed in conservation. Can our schools, by teaching, create this something? I hope so, but I doubt it, unless the child brings also something he gets at home. That is to say, the vicarious teaching of conservation is just one more kind of intellectual orphanage; a stop-gap at best.

Thus we have traversed a circle. We want this new thing, we have asked the schools and the government to help us catch it, but we have tracked it back to its den under the farmer's doorstep.

I feel sure that there is truth in these conclusions about the human qualities requisite to better land use. I am less sure about many puzzling questions of conservation economics.

Can a farmer afford to devote land to woods, marsh, pond, windbreaks? These are semi-economic land uses, —that is, they have utility but they also yield non-economic benefits.

Can a farmer afford to devote land to fencerows for the birds, to snag-trees for the coons and flying squirrels? Here the utility shrinks to what the chemist calls "a trace."

Can a farmer afford to devote land to fencerows for a patch of ladyslippers, a remnant of prairie, or just scenery? Here the utility shrinks to zero.

Yet conservation is any or all of these things.

Many labored arguments are in print proving that conservation pays economic dividends. I can add nothing to these arguments. It seems to me, though, that something has gone unsaid. It seems to me that the pattern of the rural landscape, like the configuration of our own bodies, has in it (or should have in it) a certain wholeness. No one censures a man who loses his leg in an accident, or who was born with only four fingers, but we should look askance at a man who amputated a natural part on the grounds that some other is more profitable. The comparison is exaggerated; we had to amputate many marshes, ponds and woods to make the land habitable, but to remove any natural feature from representation in the rural landscape seems to me a defacement which the calm verdict of history will not approve, either as good conservation, good taste, or good farming.

Consider a single natural feature: the farm pond. Our godfather the Ice-king, who was in on the christening of Wisconsin, dug hundreds of them for us. We have drained ninety and nine. If you don't believe it, look on the original surveyor's plot of your township; in 1840 he probably mapped water in dozens of spots

where in 1940 you may be praying for rain. I have an undrained pond on my farm. You should see the farm families flock to it of a Sunday, everybody from old grandfather to the new pup, each bent on the particular aquatic sport, from water lilies to bluegills, suited to his (or her) age and waistline. Many of these farm families once had ponds of their own. If some drainage promoter had not sold them tiles, or a share in a steam shovel, or some other dream of sudden affluence, many of them would still have their own water lilies, their own bluegills, their own swimming hole, their own redwings to hover over a buttonbush and proclaim the spring.

If this were Germany, or Denmark, with many people and little land, it might be idle to dream about land-use luxuries for every farm family that needs them. But we have excess plowland; our conviction of this is so unanimous that we spend a billion out of the public chest to retire the surplus from cultivation. In the face of such an excess, can any reasonable man claim that economics prevents us from getting a life, as well as a livelihood, from our acres?

Sometimes I think that ideas, like men, can become dictators. We Americans have so far escaped regimentation by our rulers, but have we escaped regimentation by our own ideas? I doubt if there exists today a more complete regimentation of the human mind than that accomplished by our self-imposed doctrine of ruthless utilitarianism. The saving grace of democracy is that we fastened this yoke on our own necks, and we can cast it off when we want to, without severing the neck. Conservation is perhaps one of the many squirmings which foreshadow this act of self-liberation.

The principle of wholeness in the farm landscape involves, I think, something more than indulgence in land-use luxuries. Try to send your mind up in an airplane; try to see the *trend* of our tinkerings with fields and forests, waters and soils. We have gone in for governmental conservation on a huge scale. Government is slowly but surely pushing the cutovers back into forest; the peat and sand districts back into marsh and scrub. This, I think, is as it should be. But the cow in the woodlot, ably assisted by the ax, the depression, the June beetle, and the drouth, is just as surely making southern Wisconsin a treeless agricultural steppe. There was a time when the cessation of prairie fires added trees to southern Wisconsin faster than the settlers subtracted them. That time is now past. In another generation many southern counties will look, as far as trees are concerned, like the Ukraine, or the Canadian wheatlands. A similar tendency to create *monotypes*, to block up huge regions to a single land-use, is visible in many other states. It is the result of delegating conservation to government. Government cannot own and operate small parcels of land, and it cannot own and operate good land at all.

Stated in acres or in board feet, the crowding of all the timber into one place may be a forestry program, but is it conservation? How shall we use forests to protect vulnerable hillsides and riverbanks from erosion when the bulk of the timber is up north on the sands where there is no erosion? To shelter wildlife when all the food is in one county and all the cover in another? To break the wind when the forest country has no wind, the farm country nothing but wind? For recreation when it takes a week, rather than an hour, to get under a pine tree? Doesn't conservation imply a certain interspersion of land-uses, a certain pepper-and-salt pattern in the warp and woof of the land-use fabric? If so, can government alone do the weaving? I think not.

It is the individual farmer who must weave the greater part of the rug on which America stands. Shall he weave into it only the sober yarns which warm the feet, or also some of the colors which warm the eye and the heart? Granted that there may be a question which returns him the most profit as an individual, can there be *any* question which is best for his community? This raises the question: is the individual farmer capable of dedicating private land to uses which profit the community, even though they may not so clearly profit him? We may be over-hasty in assuming that he is not.

I am thinking, for example, of the windbreaks, the evergreen snow-fences, hundreds of which are peeping up this winter out of the drifted snows of the sandy counties. Part of these plantings are subsidized by highway funds, but in many others the only subsidy is the nursery stock. Here then is a dedication of private land to a community purpose, a private labor for a public gain. These windbreaks do little good until many land-owners install them; much good after they dot the whole countryside. But this "much good" is an undivided surplus, payable not in dollars, but rather in fertility, peace, comfort, in the sense of something alive and growing. It pleases me that farmers should do this new thing. It foreshadows conservation. It may be remarked, in passing, that this planting of windbreaks is a direct reversal of the attitude which uprooted the hedges, and thus the wildlife, from the entire cornbelt. Both moves were fathered by the agricultural colleges. Have the colleges changed their mind? Or is an osage windbreak governed by a different kind of economics than a red pine windbreak?

PATCHWORK FARMS

Here a bit and there a bit
They cleared the woods away,
Here a bit and there a bit,
They tempered stubborn clay.

And so the valley patchwork,
In outlines bold and clear,
Tells how our fathers conquered
To make a home out here.

—Caspar G. Dickson

There is still another kind of community planting where the thing to be planted is not trees but thoughts. To describe it, I want to plant some thoughts about a bush. It is called bog-birch.

I select it because it is such a mousy, unobtrusive, inconspicuous, uninteresting little bush. You may have it in your marsh but have never noticed it. It bears no flower that you would recognize as such, no fruit which bird or beast could eat. It doesn't grow into a tree which you could use. It does no harm, no good, it doesn't even turn color in fall. Altogether it is the perfect nonentity in bushes; the complete biological bore.

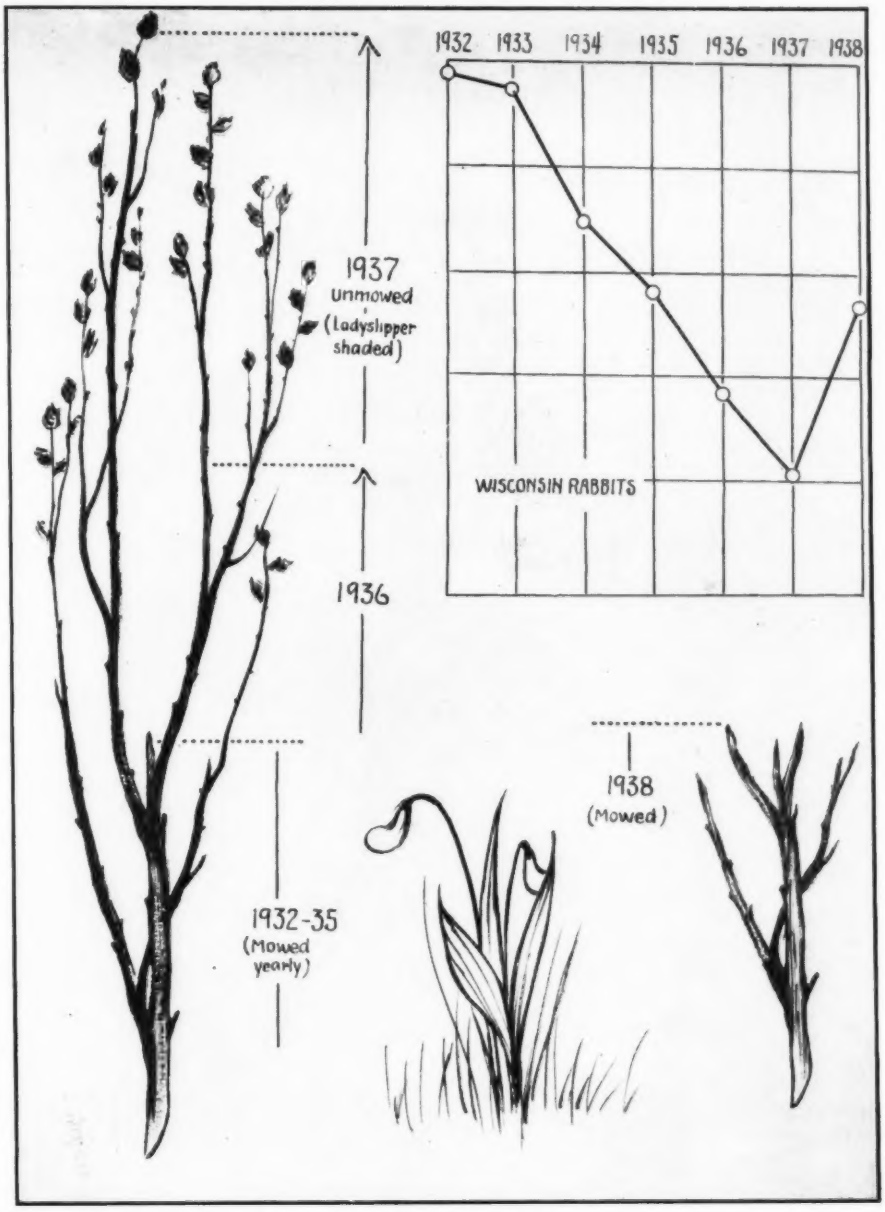
But is it? Once I was following the tracks of some starving deer. The tracks led from one bog-birch to another; the browsed tips showed that the deer were living on it, to the exclusion of scores of other kinds of bushes. Once in a blizzard I saw a flock of sharp-tail grouse, unable to find their usual grain or weed seeds, eating bog-birch buds. They were fat.

Last summer the botanists of the University Ar-

boretum came to me in alarm. The brush, they said, was shading out the white ladyslippers in the Arboretum marsh. Would I ask the CCC crews to clear it? When I examined the ground, I found the offending brush was bog-birch. I cut the sample shown on the left of the drawing. Notice that up to two years ago rabbits had mowed it down each year. In 1936 and 1937 the rabbits had spared it, hence it grew up and shaded the ladyslippers. Why? Because of the cycle; there were no rabbits in 1936 and 1937. This past winter of 1938 the rabbits mowed off the bog-birch, as shown on the right of the drawing.

It appears, then, that our little nonentity, the bog-birch, is important after all. It spells life or death to deer, grouse, rabbits, ladyslippers. If, as some think, cycles are caused by sunspots, the bog-birch might even be regarded a sort of envoy for the solar system, dealing out appeasement to the rabbit, in the course of which a suppressed orchid finds its place in the sun.

The bog-birch is one of hundreds of creatures which the farmer looks at, or steps on, every day. There are 350 birds, ninety mammals, 150 fishes, seventy reptiles and amphibians, and a vastly greater number of plants and insects native to Wisconsin. Each state has a similar diversity of wild things.



THE STORY OF A CYCLE

A mousy, unobtrusive, inconspicuous little bush, the bog-birch, plays an important role in the ups and downs of plant and animal life. Here is illustrated how it spells life or death to deer, grouse, rabbits, and ladyslippers in Wisconsin.

In 1932 to 1935 rabbits were abundant and ate down the bog-birches each winter, giving the ladyslippers the sun. During 1936 and 1937 the cycle decimated the rabbits and the bog-birches grew high and shaded out the ladyslippers. In 1938 the rabbits recovered, mowed down the birches and the ladyslippers regained their place in the sun.

Disregarding all those species too small or too obscure to be visible to the layman, there are still perhaps 500 whose lives we might know, but don't. I have translated one little scene out of the life-drama of one species. Each of the 500 has its own drama. The stage is the farm. The farmer walks among the players in all his daily tasks, but he seldom sees any drama, because he does not understand their language. Neither do I, save for a few lines here and there. Would it add anything to farm life if the farmer learned more of that language?

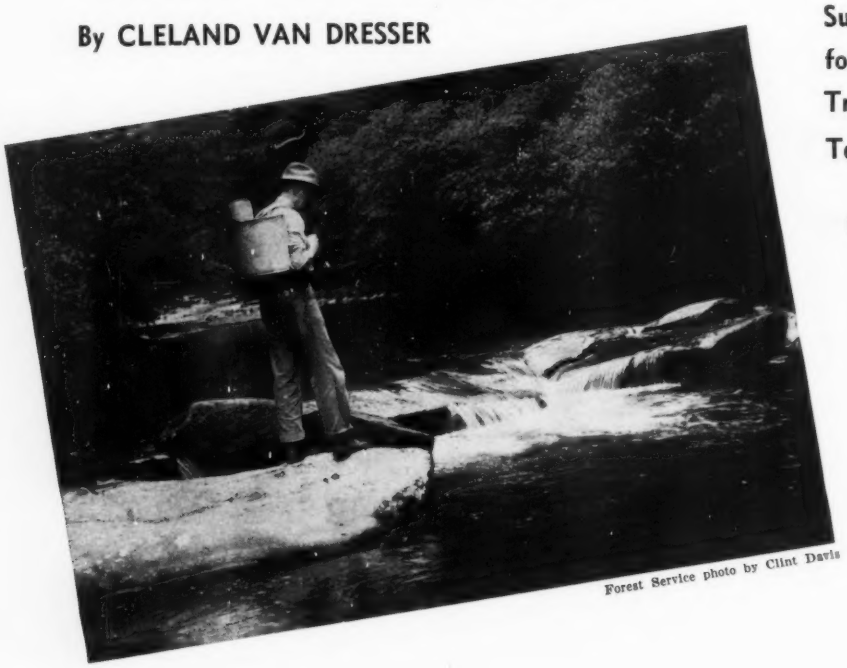
One of the self-imposed yokes we are casting off is the false idea that farm life is dull. What is the meaning of John Steuart Curry, Grant Wood, Thomas Benton? They are showing us drama in the red barn, the stark silo, the team heaving over the hill, the country store, black against the sunset. All I am saying is that there is also drama in every bush, if you can see it. When enough men know (*Continuing on page* 316)

RIVERS OF OBLIVION - -

By CLELAND VAN DRESSER

Such are Many of the Streams for Millions of Hatchery Raised Trout Which are Being Planted Today in Our Inland Waters

Photographs by the Bureau of Fisheries



Forest Service photo by Clint Davis

Planting fingerlings in the Pisgah National Forest—where will the little fish go from here?

THE ninety-five fish hatcheries of the federal Bureau of Fisheries placed approximately eighty million trout in the streams and lakes of the United States last year. Most of these fish were fingerlings and larger. If the licensed anglers of the nation caught them all, each hooked and creeled an average of better than eight trout which owed their existence to the work of the bureau. But eighty odd million game fish, raised in federal hatcheries and "planted" in native waters by individuals, organizations and states, never ended their careers at the end of the angler's line. Great numbers of them—probably over eighty per cent—died, because they were unable to cope with conditions they encountered when taken from rearing ponds and released in streams and lakes. The same can undoubtedly be said for an additional 165,000,000 or more trout raised in state fish hatcheries.

Why the high mortality rate after they were released? The answer to this question is not so simple. Despite the millions of dollars spent to raise these fish little attention has been paid in the past to the conditions of the waters in which they were planted. Although biologists know what conditions in streams are favorable to fish, the system of fish planting and fish distribution has seldom been planned in accordance with this knowledge. Even though fish are not often planted in quantities in waters that are grossly polluted, thousands unquestionably have

A stream improvement crew at work creating better living conditions for fish and consequently better angling

been sacrificed in waters where even slight pollution from industrial wastes insidiously destroys the food supply or prevents natural propagation.

In other cases, game fish were liberated in streams which, although comparatively clean, were lacking in adequate food sources with the result that they starved to death. The high temperature of other waters contributed to the death of additional thousands and in some cases fish were planted in streams that go dry every summer. The condition of inland fishing today is evidence to the most casual sportsman that the process of dumping large quantities of fingerlings into streams and lakes is not resulting in better angling. More must be learned about aquatic conditions which the fish will encounter when released if reasonable benefits from extensive stocking operations are to be obtained.

A thorough survey of the nation's streams appears urgently needed. Such surveys should be designed to reveal the extent and character of fishing waters; the fitness of the physical, biological and chemical environment; the available food supply; the presence or absence of enemies and predators, and the standing population of food and game fishes already present. In other words, there should be a method of ascertaining what chances a hatchery raised trout has of surviving when he is seined out of a rearing pond and told to fend for himself in other waters. The value of these studies is readily apparent. If the stream is lacking in pools, this condition can be remedied by the construction of dams and deflectors. If riffle areas that provide the major food supply of bottom organisms are deficient, the current may be speeded up by suitable devices. If necessary weed beds are lacking, they can be supplied. If the stream has fewer fish in it than it is able to support, this deficiency can be made up by stocking fry and small fingerlings. Also if the stock is being reduced by overfishing, more adult fish can be planted.

State and federal hatchery methods have been developed to

Flora and fauna gathered from the bottom will determine the food contents of a stream

Exact chemical analysis will show the condition of the stream water

And minute inspection reveals the amount of aquatic life the stream will support

high efficiency in the face of many difficulties. First the problem of proper feeding presented itself. Then arose a more serious problem—that of overcoming disease. The control of fish diseases is a relatively new science and there is much yet to be learned. Due to concentration of large numbers of trout in rearing ponds, an epidemic may break out and take devastating toll of the fish life. Uncontrolled disease probably has been the greatest single source of loss in the hatchery system.

To combat this, the Bureau of Fisheries has put into operation the "fish hospital" located in Seattle, Washington. Here, Dr. Frederic F. Fish of the Bureau, who has a well equipped biological laboratory, renders service to fish culturists by mail. Hatchery men the nation over now send specimens of diseased fish (preserved in formalin) which Dr. Fish diagnoses and for which he prescribes suitable remedies. This work contributes immeasurably in keeping disease epidemics under control.

When in the Eighteenth Century, a German, Lieutenant Jacobi, made the discovery that trout could be stripped of their eggs and fertilized artificially, it was thought that it would be a simple task to re-populate depleted streams abundantly. Ever since that time, more and more money has been spent on hatcheries, but in spite of expenditures and development of hatchery technique, fishing has declined. For instance, in our own country, during the past forty years the hatchery output of California has been multiplied seven times—but it is costing the state twenty-five times as much to produce the increased number of fish and the angling isn't as good as it used to be.

The order in America has been "millions for hatching, but not one cent for stream investigations." Fish have been planted indiscriminately for those who had the most pull with state or federal legislatures. Trout have been a political football, and the local ward heeler who could get them planted in his district got the most anglers' votes.

Imagine the directors of a bank investing a million dollars in a project with no idea of whether there would be any return from that money! Yet that is exactly what has been happening with the hatchery program. Millions of fish are being raised and released at considerable public expense, but are the anglers and the public generally getting full benefit? The answer to that in most cases is a definite NO!

The hatchery men know their business and can produce within reason all the young trout our streams and lakes can support. (Sportsmen may not realize it, but eggs and fry derived from domestic stock are superior to those obtained from wild fish.) Equally important is provision for determining what constitutes the proper environment in which to release fry and fingerlings. Two streams may look alike to the layman, but they may differ widely in their ability to support fish. One may be especially suited to rainbows and not at all to brown trout and Loch Levens; in another the reverse may be the case.

In 1937, the United States Forest Service and the Bureau of Fisheries cooperated in studying this vital question. Squaw Creek in the Shasta National Forest, California, was selected for the study. Previous to 1937,—from 1932 to 1936 to be exact—10,000 Eastern brook, 120,000 rainbow and 140,000 Loch Leven had been released in Squaw Creek. A careful tabulation of the angler-catch of 1937 revealed that 2,504 trout were recorded. Of these, 2,497 were rainbows, and only seven were Loch Leven. No Eastern brook trout were caught.

Evidently conditions in Squaw Creek are not conducive to the natural reproduction of Eastern brook and Loch Leven, and therefore stocking these fish has been a waste of time and money. In a case like this there are two courses of action: determine what is wrong with the stream and correct the condition so that Loch Leven and Eastern brook can survive, or concentrate on rainbow alone. Fish Lake in the Umpqua National Forest in Oregon is another example. In 1937 the Forest Service reported that 5,946 trout were caught. Of this number 5,878 were native rainbows and only sixty-eight were Eastern brook trout. No other species were caught although 20,000 cutthroat and 40,000 Eastern brook had been released in the lake the preceding years. What became of these fish?

These are but two illustrations of what has been learned about the results of plantings in streams studied. The number of streams stocked with fish in the United States is enormous. There are more than 70,000 miles of them in national forests alone. Yet, with but limited exceptions, nobody knows anything about the conditions of these waters.

It is a relatively simple matter to adjust hatchery production to the needs of a stream, and if necessary, change the condition of the stream so that it will support more aquatic life. Jay N. (Ding) Darling has declared that millions of fish have been poured into streams where they have no more chance of surviving than if they were planted in the middle of U. S. Highway No. 1. That is not an over-statement, and it emphasizes that there is almost a total lack of common sense in present day methods of planting fish from federal hatcheries, as well as from the 400 odd state hatcheries. There is a simple solution to the problem. Find out the condition of our lakes and streams—what species of fish they can support—how aquatic conditions can be improved—and plant fish accordingly. This will require no additional bureaucratic organizations than now exist within the federal Bureau of Fisheries and the various state game and fish commissions. There are a few trained men in both governmental administrations who are willing and capable of undertaking this work, and who have done a limited amount of it successfully in the past, but there should be more of them and they are limited by lack of funds.

But, at the present writing, the old order of "millions for hatcheries and nothing for investigation" still persists. If there is not some sound sense displayed in determining the condition of streams and lakes into which expensively reared trout are poured, anglers are still going to pay for licenses and catch few fish, for—fish, like humans, can't live when there isn't enough food and oxygen.

TREE LULLABY

The first whispered song of the world
Must have been the crooning lullaby of the tree-leaves
In the Garden of Eden;
The same song that today the heart listens to
In this hushed silence
Of God's forest of singing pines;
Let the heart forget its sorrow in the organ notes of trees,
Where a needled prayer-rug calls on man to bend his knees
Before the mighty grandeur of these monarchs, ages old,
Who give protective friendship to the seeking heart
Grown cold.

—Alice Churchill Chaphe

CABIN FEVER

BY CLYDE M. BRUNDY

Photographs by the Forest Service

The ideal in cabin construction—perfectly set—a real home in the woods

THERE is enchantment in the thought of building a cabin in the woods—a rustic place to hide away, to relax and build up new vigor. But even in so romantic a venture it is unwise to be carried along blindly by the enthusiasm of creating something. A home in the forest, like a home anywhere else, should be built with caution and sound judgment. Practical consideration of location, architecture and materials is just as important on the banks of some mountain stream as on Main Street, and the cabin builder will do well to approach these problems with calm deliberation. What purpose must the cabin serve? How does it fit into its surroundings? How will it appear and serve after a few years?

I recall the case of Lafe Harding. Lafe is one of those sturdy fellows for whom the outdoors holds endless appeal and who derives some intangible thrill from scaling Colorado's higher peaks. When Lafe decided to build a cabin he was pretty individualistic about it, and would have none of the sites recommended by the Forest Service. Instead, he obtained possession of an abandoned mining claim high on the Medicine Bow Range. Here he constructed a substantial cabin and spent a considerable sum on it.

He finished the cabin in early September—and did not see it again until the next July. For nine months the cabin was snowbound by the seemingly endless storms that are common to an altitude of 11,000 feet. When finally he did reach it he found that heavy snows had broken the roof, that pack rats had exercised their privilege of exchanging sticks and stones for everything packable, and that a rockslide had completely covered the cache in which he had stored provisions. To top it off, an acquaintance who had accompanied Lafe to the cabin found the altitude too great for his heart and was forced to leave. Lafe accompanied him, and did not return to the cabin again until mid-July. The chaos he found then was complete. Vandals had broken into the structure and stolen everything of value.

Because of such experiences, there is a new attitude today toward the place of summer homes in the forest. Where once the summer home builder was permitted

more or less freedom of choice in location and architecture, he is now governed by certain basic policies which look to constant land usage that will insure the greatest good to the greatest number of users. This is particularly true on the national forests where, in the early days, summer homes were built more at random, sites often being chosen which today are needed for camp grounds or other public recreational areas. The present policy of the Forest Service in administering the national forests restricts summer homes and other exclusive uses to areas not needed for general public use. Thus the cabin builder, if he goes to the national forests, will find that location, architecture and materials become items of major importance, not merely because they are desirable in any structure, but also because they have a very definite place in forest use planning.

landscape architects. Each location is chosen with the thought of future occupants ever in mind. Due regard is given to altitude, scenic attraction, water and sanitation, wood supply, nearness to recreational areas, accessibility, and so on.

The charge for a summer home location in such an area varies from about $15 to $30 a year. Lots are of a size to insure reasonable privacy. In many instances arrangements are made by cabin owners for a year-long caretaker to police the area. Thus vandalism and petty thievery are checked. Plans for building on such lots must be submitted to and pass inspection by forest officers prior to construction.

So if you are struck by cabin fever your first step is to visit several of the planned summer home areas on your nearest national forest. Weigh carefully their various advantages and disadvantages as they apply to you and your family. Keep in mind the things you like most to do. If you are an ardent fisherman, don't construct your cabin where mountain climbing is excellent, swimming also good—and the nearest trout stream fifty miles away. Don't repeat the mistake of one enthusiastic deer hunter who completed a fine lodge only to find that it was situated in a major game preserve.

Attractively planned summer home groups, such as this, remove many of the hazards from fire and marauders to which the individual owner of an isolated cabin is often subjected

Lafe Harding wasn't an exception in desiring a cabin "over the hills away from everybody." People may be gregarious, but at the forest boundary this desire for others' company breaks down to quite a surprising extent. And such a mania for seclusion has brought about conditions undesirable for both the cabin owner and the national forests.

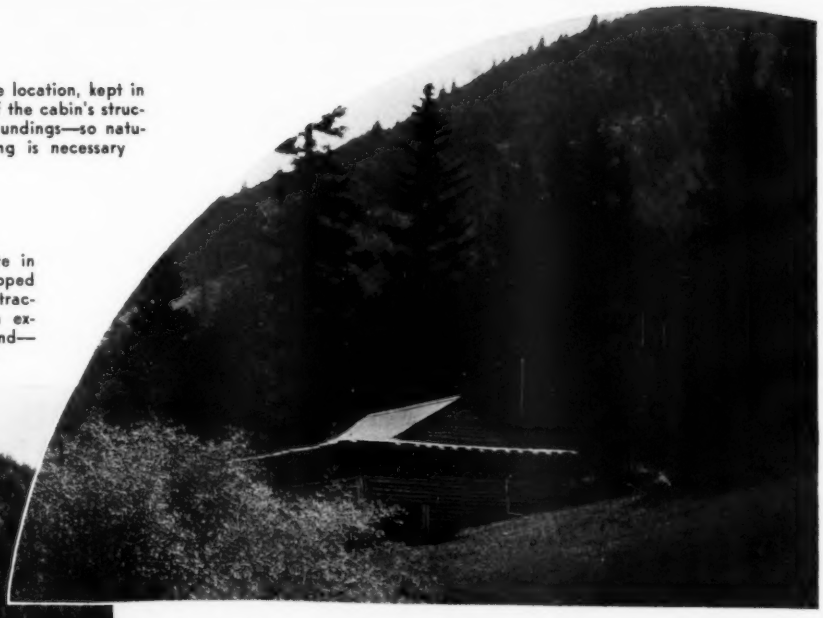
Isolated cabins seldom have sanitation, water facilities, protection from marauders and availability of supplies equal to those maintained at more accessible cabin sites. Too often owners have built cabins on some particular spot because of scenic and other attractions, and have then been confronted by conditions which made living in the cabin an actual hardship. Important also is the fact that such remote cabins present fire hazards for themselves and for the forest at large.

Permits for single cabins are seldom issued by the Forest Service. Instead, planned summer home groups are being laid out by competent forest officers and

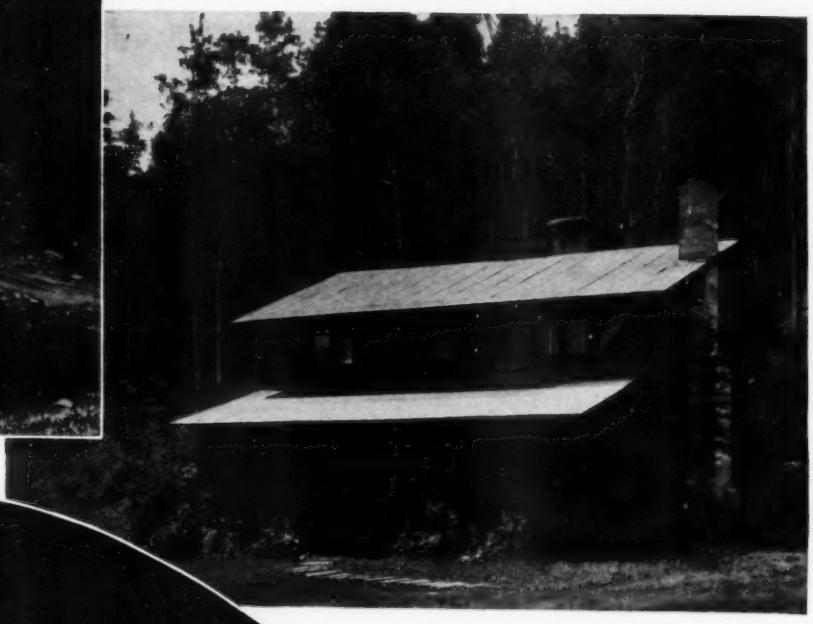
Once you have acquired a cabin site and are ready to build, remember that simplicity is the keynote of good forest design. Plan to avoid that which smacks of city conditions. Visualize your completed set-up. Before construction is begun, stand on the cabin site and study both the adjacent and distant views. Remember that a large portion of your time will be spent in the cabin. Plan your view from the cabin looking out—not from the roadway looking in.

Even before the foundation is laid, plan to employ structural designs and exterior finishes that will eliminate "clash." Buildings should (*Continuing on page* 325)

Right—An excellent summer home location, kept in its natural state. The simplicity of the cabin's structure is in harmony with the surroundings—so naturally beautiful that no planting is necessary



Below—This is about the ultimate in undesirability. All vegetation lopped off regardlessly, leaving the unattractive, shoddily-constructed cabin exposed,—on a raw spot of ground—unscreened by tree or shrub



A larger type cabin on a well chosen site. Low shrubs screen the foundation of the attractive slab-covered building. The corrugated iron roof is the only false note

Left—A fine summer home location—attractive cabin of rubble stone construction, with the surrounding yard left in its native state

THE LITTLE LOST LAKES

By HARRY BOTSFORD

SOMEONE with a drop of philosophy in his blood once remarked that the lot of the dry fly fisherman was a happy one because while he had only a few scant and hurried weeks of trout fishing he had the balance of the year in which to fuss over his tackle. I have tried endlessly to generate a sense of philosophy which might be utilized to comfort me in the "off" season, and while I do enjoy the tedious art and science of tying my own flies and of seeing that rods and joints and line and reels are in perfect condition, nevertheless occupations of this character pall on me, especially when the sun shines and the outdoors invites. I may be and probably am, unreasonable in stubbornly clinging to a quaint belief that there just isn't any compensation for the rising smash and resultant pull and struggle of a good fish!

Other dry fly purists, I find, have faced the same tragedy. A few meagre weeks of good or mediocre trout fishing—then the Law. That wise and beneficent instrument becomes vocal and says in a ringing voice "No more!" And then, regretfully, several hundred thousand of the faithful sadly start in on the solemn business of fondling tackle and getting ready for the next season.

I decided to do something about it and started in on a long series of harmless but interesting experiments. Likewise, they were legal. I am happy that I did, for they have opened up a new vista of fly fishing and also, in effect, have enlarged and lengthened the dry fly season several months. Out of these experiments I have been discovering the little lost lakes that appear to abound in almost every state—the weary looking little ponds that hide in swamplands and behind secret acres of woodland. It has been such genuine sport and adventure that I am willing to pass it on to other dry fly fishermen who bemoan the passing of each fleeting trout season.

The formula is absurdly simple. Arm yourself with your lightest rod, a double-taper line of superlative slenderness, some 000 dry flies, a fitting reel and you are ready. Cast back in your mind and recall some forgotten little lake within easy driving distance, some little lake once famous for its bass, perhaps, but which for years enjoyed the unenviable reputation of being "fished out" and therefore scorned by bass fishermen and forgotten by those amiable people who periodically stock decent waters with proper fish. When you reach it, maybe you'll discover, hidden in the lily pads, an ancient water-logged boat. If so, you are in luck.

Paddle out in the forgotten and scorned lake and rest while you put your tackle together. Approach your job as if you were going after a wary old trout and select your fly with care and prayer. You might try an orange quill or an Oliver spinner at first. Watch the surface of the water carefully and if you see what appears to be a fish rising, you are getting hot. Cast carefully, lay your fly on the surface of the water with every ounce of skill at your command. Wait a matter of a few seconds and then twitch your rod tip gently. Bang! Something will hit that tiny tuft of barbed feathers and, if you're alive to the situation, you will set the hook. Watch that little rod arch! There's a million dollar thrill in those minutes as you may be forced to let out line. Slowly, reluctantly you bring in line and beneath the ruffled surface of the water you see—a fine, fat blue gill. Net him carefully and hold him up to the sun. Isn't he a beauty? Note the coloring, the sturdy body and the eye. Possibly not comparable to a rainbow trout, but still an active denizen of the waters and well worth taking on light tackle. Possibly he won't weigh over half a pound, but the poundage of the blue gill is so arranged by a beneficent and shrewd Nature that it is designed to cause a lot of trouble when he is on the right end of light tackle.

Dozens of these little lost lakes abound in what have been most scornfully and ineptly called "pan" fish—blue gills, sun fish and perch. Worm and bait anglers hopefully try for them but they, as a rule, refuse to pay any attention to such plebeian fodder. They want flies!

The rewards of this type of angling are many. Some of these little lakes may really be fished out and barren of fish. It will take time and patience to discover this. Others may literally teem with fat, saucy, indifferent blue gills of phenomenal size—yet they may refuse your very best flies cast in the most approved manner. When you strike a situation like this, then the fun begins. Proceed as you would in trout fishing. Study the flies that the fish seem to be taking, then try to match them from your fly box. Try different sized flies—different patterns. I recall an exciting instance when I had tried every fly but one in my kit. That fly was a yellow May and only once in a long career of trout fishing have I ever found a trout that would take it. Pessimistically, I tied on the yellow May, cast it into a pocket in the lily pads and at once found myself tangled up with the biggest crappie I ever hooked. I lost him, I might add. But my next cast caught the instant fancy of a lusty blue gill that almost tipped the scales at a pound and I had a real battle netting him. After that my sport was fast and furious and I left the little lake at sundown with fifteen very fine fish and thoroughly satisfied with the evening's sport. Next year I have a date with that old granddaddy of a crappie!

Your family, too, will approve of this search for the little and forgotten lakes. Many times even the most skillful fly caster will come home with an empty creel. Seldom, indeed, does the seeker after the little lost lakes come home without fish. And, if they are called "pan" fish, it is with good reason. Properly cooked in butter they vie with trout for flavor.

Never leave a lost or forgotten lake or pond without a try for perch. Seldom, if ever, will one of them take a surface lure. They are deep feeders and have a distinct and voracious preference for a particular and special diet.

Forget, for the time being, that you are a purist and that the dry fly is the ultimate and gentlemanly lure. Use a tiny, say a 00 size wet fly. Try a scarlet ibis, for perch prefer red. To the fly, attach a speck of a gold

spinner. Whip out the fly, let it sink, then retrieve with short jerks calculated to keep the spinner flashing in a most enticing manner. If you do this in the immediate vicinity of a few hungry and lusty perch you are destined to have action—plus. When your perch strikes, he strikes savagely. Then he desperately strives to get to the bottom of a weed bed. That makes your job interesting and exceedingly active. Once he succeeds in getting that stubborn nose of his in a tangle of weeds, you may as well lay down the rod and attempt to bring him in by stripping in line slowly and prayerfully. But, if you prevent this, you will find the perch a tough, valiant fighter. It takes longer than you may think to conquer him. More often than not you will take perch that will go better than a pound—and a pound perch will give you a battle that is almost as full of thrills as a trout of equal size.

Perch are full of moods. Frequently when the sun shines they will sulk and refuse to offer at any type or size of fly. But try them when a misty rain is falling. Then you will get action and plenty of it. Often on a dark and dismal day—just the type of day when you would naturally expect best results from a fly such as a white miller—you will find the perch most perverse. They will offer constantly and savagely at a black gnat and a spinner.

This type of fishing can be carried out during the entire summer and fall. Sometimes it is ideal during the middle of the day, a period when trout seldom feed. It has another great advantage—it calls for extreme skill in the matter of placing a fly accurately. The careless caster can expect ill luck. The caster who gauges each cast and who takes pride in placing a fly as lightly and as accurately as possible will inevitably get action and pleasing results.

Try seeking the "fished out" lakes. It will not only make you a better and more accurate fly caster for trout but it will make it possible for you to cast flies during the entire summer and fall. Whenever you have a couple of hours to spare of an evening, go venturing forth seeking a new pond. I remember a farmer, highly skeptical, told me about a little pond behind a grove of pines on his farm. He said that once there used to be fish in it but of late only a few little fellows had been caught. I tried it and found it contained some of the largest crappie bass I had ever caught on a four-ounce rod. I presented the amazed and grateful farmer with a half-dozen of them and earned his everlasting gratitude. Today that lake is virtually *my* lake. I share the catch always with the farmer. That, I might add, is a sound policy to follow and one that will earn you dividends.

Franklin Gray McIntosh

Bait your hook and cast your line, with every ounce of skill at your command

Too many of us have believed that trout are the only fish worth taking on a light rod. I still have a deep reverence for his majesty—but I respect the blue gill, the sun fish, the crappie and the perch. They, too, have their place in this scheme of things.

I prefer to keep my tackle busy during the summer months. If the press of business keeps me, as it frequently does, away from my favorite trout streams, I console myself with the thought that I'll make up for it later when I discover some new lost lakes and ponds and when I revisit some of the old ones I have discovered. I have this consolation—that I will then enjoy solitary fishing. And, when I fish, I enjoy being alone. I want to soak in the glory of a sunset by myself; I like to store away the song of a meadowlark. Like a miser I cling to the memory of a wild duck winging across the scarlet of the western sky. I treasure the memory of blue smoke rising against a morning sky and the silver echo of a cow bell and the bark of a dog.

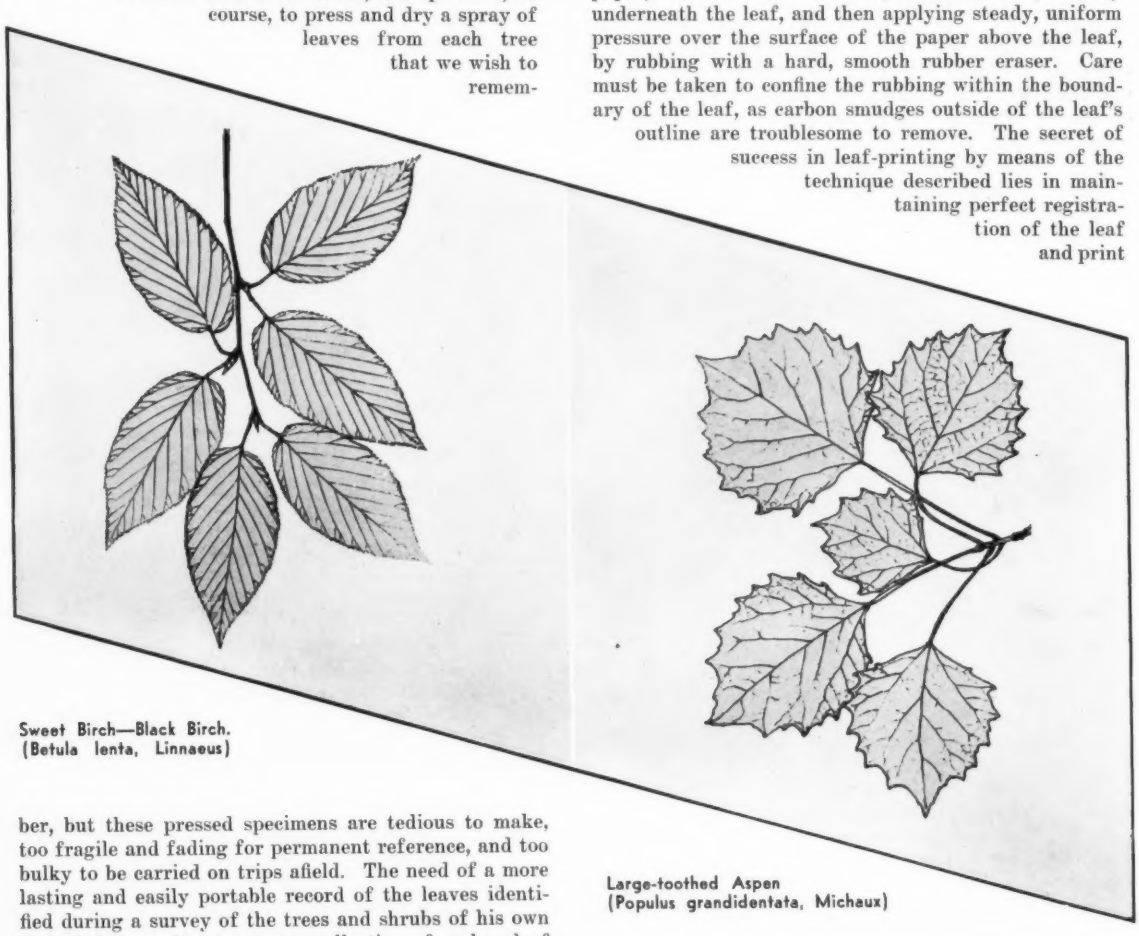
But, there's so much of genuine joy in this business of finding little lost lakes that I want to share *that* with you. The incidentals you'll discover yourself.

LEAF-LORE —

BY GEORGE C. MASON

THE leaves of a tree are its calling-cards, not so easily read, perhaps, as those of our human associates, but none the less definitely informing one of their owner's name and family, as they are found along woodland paths. A collection of these leaves furnishes a ready means of extending one's acquaintance with many kinds of trees, not only in the woods but also on city streets.

To make such a collection, it is possible, of course, to press and dry a spray of leaves from each tree that we wish to remember, but these pressed specimens are tedious to make, too fragile and fading for permanent reference, and too bulky to be carried on trips afield. The need of a more lasting and easily portable record of the leaves identified during a survey of the trees and shrubs of his own state led the writer to start a collection of carbon leaf prints.



Sweet Birch—Black Birch.
(Betula lenta, Linnaeus)

Large-toothed Aspen
(Populus grandidentata, Michaux)

In making these prints, a good grade of typewriter carbon paper is used as the recording medium and a special technique has been developed which gives clear, sharp prints instead of the "fuzzy," unsatisfactory results usually obtained by this method. The prints are made on a block or tablet of white paper, smooth and of good quality, but not too thick or stiff. A tablet five inches by eight inches in size, such as often is made up as a "scratch pad" for figuring, has been found to provide enough room for printing single specimens of the larger leaves or entire sprays of the smaller ones. It is essential, as will be explained later, for the paper to be well gummed together down one of the long edges of the tablet.

The special technique developed consists in laying the leaf, face side up, underneath the top sheet of white paper, with a sheet of carbon, ink side down, directly underneath the leaf, and then applying steady, uniform pressure over the surface of the paper above the leaf, by rubbing with a hard, smooth rubber eraser. Care must be taken to confine the rubbing within the boundary of the leaf, as carbon smudges outside of the leaf's outline are troublesome to remove. The secret of success in leaf-printing by means of the technique described lies in maintaining perfect registration of the leaf and print during the entire printing process, and this is only made possible by the gummed edge of the tablet, which keeps the paper from shifting. The leaf must be held firmly down with one hand while the rubbing is done with the other, in order to prevent even the slightest change in its position relative to the paper. If the rubbing has been carefully done, a clear impression of the leaf and its veining will be found on the white sheet under the carbon paper. This print may then be completed by pencilling in the leaf stems, twigs and buds, and further

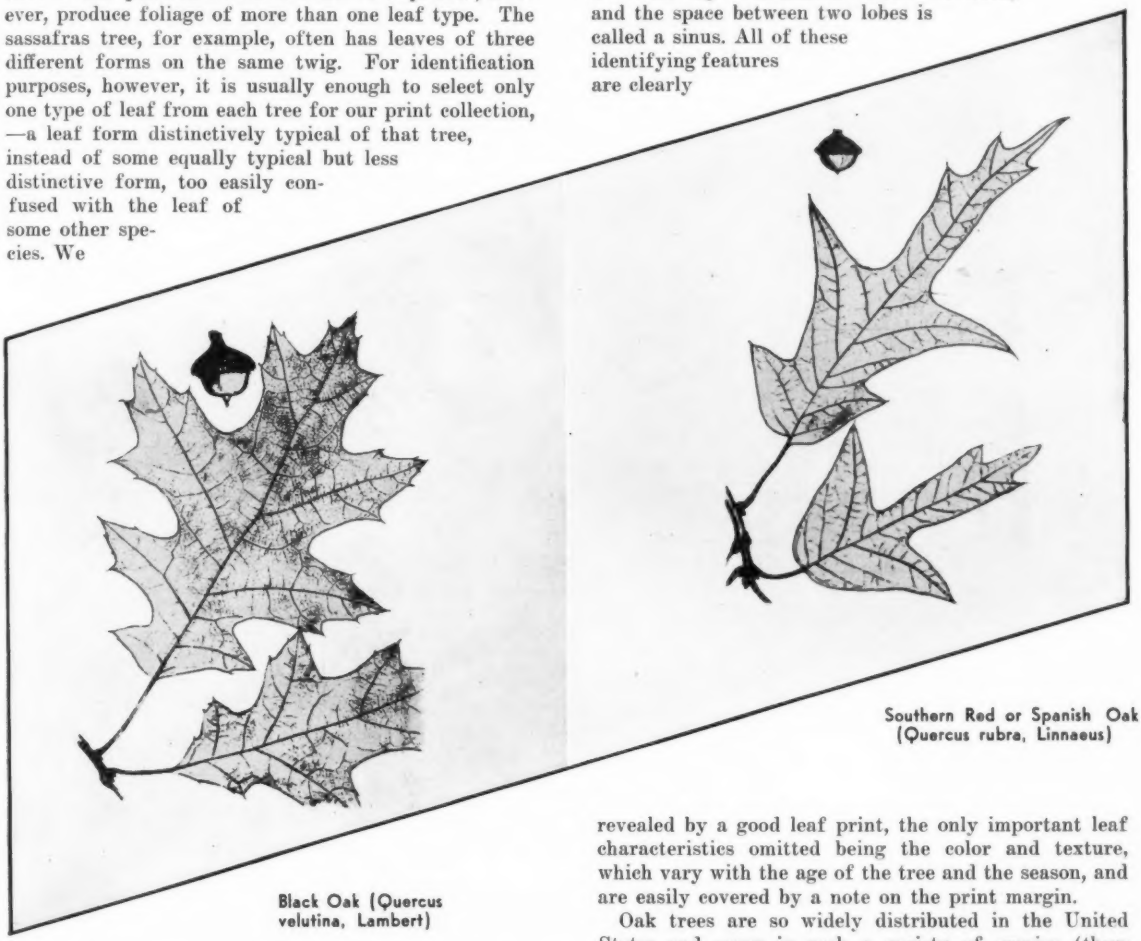
WITH CARBONS—

CHOOSE AND PRINT YOUR OWN!

embellished with sketched-in fruits and flowers, if one has the requisite skill with a pencil. It may also be desirable to retouch the weaker portions of the print to give it a uniform appearance.

A large tree may have as many as 500,000 leaves, no two of which are exactly alike, yet all following with wonderful fidelity the more or less intricate leaf pattern of that particular kind of tree. Many trees, however, produce foliage of more than one leaf type. The sassafras tree, for example, often has leaves of three different forms on the same twig. For identification purposes, however, it is usually enough to select only one type of leaf from each tree for our print collection, —a leaf form distinctively typical of that tree, instead of some equally typical but less distinctive form, too easily confused with the leaf of some other species. We should never expect to find this truly typical leaf on young shoots or on branches near the ground, as the topmost leaves on a mature tree are the most normal, and sprouts and young saplings apt to put out oversized leaves of all sorts of freakish shapes. It is not advisable to attempt leaf-printing before the trees are fully out in the spring, as immature leaves are too soft to make good prints, but successful prints may sometimes be made in winter from undecayed leaves that are flat and whole.

In learning to identify trees from the appearance of their leaves, the principal points to be noted are the arrangement of the leaves on the twig, whether opposite or alternate; the type of leaf, whether simple or compound; its general shape, whether round, oval, heart-shaped or otherwise; and the character of its edges, whether lobed, toothed or entire. Large projections from the edge of a leaf are known as lobes, and the space between two lobes is called a sinus. All of these identifying features are clearly revealed by a good leaf print, the only important leaf characteristics omitted being the color and texture, which vary with the age of the tree and the season, and are easily covered by a note on the print margin.



Black Oak (Quercus velutina, Lambert)

Southern Red or Spanish Oak (Quercus rubra, Linnaeus)

Oak trees are so widely distributed in the United States and occur in such a variety of species (there are over sixty kinds of oaks to be found between Maine and California) that their identification makes a good starting point for our tree study with leaf prints. Their leaves are firm in texture and strongly veined, hence they are easily printed, even by a beginner. After a little study, the various species of oak leaves, at first confusingly similar, are seen to be distinctive in many ways. Our native oaks are divided into two groups, the white oaks and the red oaks. The white oaks produce the most durable lumber and (*Continuing on page* 331)

PROVIDING CREDIT FOR FOREST RESTORATION • • •

By A. H. MUSSMAN
and
CONRAD H. HAMMAR

THE USE OF credit by modern business and industry is so general that our present society is often referred to as a credit economy. Among the larger industries of the country only forestry has failed to make full use of this most potent of all modern financial instruments. Even the program of the New Deal reflects the situation; it depends upon the extensive use of credit to carry forward its program for all other industries. For forestry, however, the Administration follows the now traditional but expensive and painfully slow program of purchase established decades ago. Indeed so expensive is this program of purchase that centuries will be required at the present rate of progress to bring about the badly needed restoration of our forests on lands still without management.

The reasons so little credit is used for forestry are mostly quite patent. First, there has been little or no genetic forest culture in the United States until recently. Such credit as has been employed in wood production has been used by the lumber industry. Lumbermen in the country have cut trees, not grown them. Only after nearly all the trees had been cut did the need for growing them appear emphatic enough to raise the problem of getting credit for forestry.

Second, the pattern of forest land ownership has been a miserable one for the purpose of credit extension. It is largely absentee ownership. Furthermore, while there are many exceptions to the rule, forest lands are held in tracts of small value. Ownership is, in other words, not only too diverse but forest land values, after the timber is gone, are very low. Credit experience makes it clear that lending small amounts upon widely separated properties is an expensive matter. Yet because of the often excessive time period involved forestry, of all industries, stands in greatest need of low cost credit.

Third, the very length of the waiting period for income from the growing timber has made critical the need for providing continuous management. Abundant and cheap credit is not forthcoming until continuous management from seedling stage to harvest is provided. Such management has not been provided for the bulk of American forests and plans to provide it are still in a beginning or early stage.

Fourth, a closely associated point is that, where there is no management, risks of certain kinds are at a maximum. Perhaps the two greatest risks are from fire and theft. Both would be largely eliminated by the establishment of management and control.

Fifth, tax uncertainties have contributed unwholesomely to the weakness of forestry in its plea for credit. Creditors would be foolish to lend upon forest property as long as impecunious local governments have so potent a prior lien on forest assets with from twenty-five to forty years to exercise their prerogatives. Forestry faces persistently the unpleasant hazard that local officers will go as far as they can in levying their tribute on forest property particularly just before the trees are to be cut and removed from the tax roll. It is at just this stage, with values high, that even a restrained application of local rates under the property tax can effectively destroy all profit margins.

If the forestry industry is ever to make a full use of credit these financial disabilities must be removed. In a recent article by one of the authors a plan is presented that will accomplish their removal. The cardinal points of the plan are (1) private persons will continue to own the land; (2) the government will, however, take over control of the land and will develop and manage it for timber production; (3) the government will pay the costs of development reimbursing itself for its outlays from the later sale of stumpage; (4) to give them a return upon their investment private owners will receive a predetermined share of the income, and (5) private persons will no longer pay taxes but the government will pay to the local governments in lieu of taxes a predetermined amount which will be about equal to the normal local levy on property of equal income producing power. The local administrative units under the plan are to be Forest Conservation Districts comprising about 200,000 acres each and to be managed in a manner closely patterned after the present day management of ranger districts in the national forests.

Operation of the plan would eliminate every serious difficulty that now obstructs the use of credit for forest restoration. A genetic forestry would replace the exploitive and extractive lumbering of the past. Absentee ownership of small tracts would immediately be replaced or supplemented by large consolidated units under competent technical and managerial supervision. Credit would be granted upon an inexpensive basis or to the Forest Conservation District as a whole. Management would be continuous and fire and theft risks reduced to a minimum. Provision is made for equitable adjustment of taxation difficulties.

It was in connection with this plan that the use of credit in forest restoration was suggested and the establishment of a Forest Credit Corporation proposed. In brief this Forest Credit Corporation would be used to supply forest credit much as the Farm Credit Administration is now used to supply low cost money to farmer borrowers.

For a number of reasons a public corporation to grant forest credit should be independent of other governmental credit institutions. Its volume of business would be large and it would gain all the needed advantages of large scale operation. Its business would be of a specialized nature requiring a quite different type of technical knowledge and training from that now found in existing credit institutions. Its regional set-up would need to be different from that of existing credit institutions and

should fit the forest regions of the country.

The proposal made herein, therefore, prescribes one central Forest Credit Corporation (to be located at Washington and to have functions not dissimilar to that of the Farm Credit Administration) and nine Regional Forest Credit Banks. The regional headquarters for each bank should be in the same city where the Regional offices of the Forest Service are now located.

A forest Credit Commissioner or Governor would head the entire system. Six operating divisions would be provided within the Forest Credit Corporation and in each of the Regional Banks as indicated below. These respective divisions of the Forest Credit Corporation would be headed by (1) A Registrar; (2) a Director of Finance; (3) a General Counsel; (4) a Director of Appraising and Timber Estimating; (5) a Director of District Organization and Coordination and (6) a Director of Private and Municipal Forest Credit. Each division would have its counterpart in the Regional Bank. In addition to these major divisions and officers, there will be district accountants located in each Forest Conservation District.

The system in operation would grant credit in two major directions, that is to the Forest Conservation Districts and to private and municipally owned forests. The lands and forests of the Forest Conservation Districts would be developed and the monies loaned spent by the United States Forest Service upon a budgeted basis after these districts had been formed and agreements entered into with land owners. Loans to private and municipally owned forests would be made in a manner to supplement rather than to interfere with the formation and operation of the Forest Conservation Districts.

In general the operation of the system would be along lines now customary for such quasi-public credit institutions as the Farm Credit Administration. That is, to obtain the needed money, debentures bearing the guarantee of the Federal Government both as to the payment of interest and principal would be offered for sale to the investing public. The Federal Farm Mortgage Corporation is at present permitted to market debentures (up to a total of $2,000,000,000) with this same government guarantee. A precedent therefore exists.

The role of the Forest Service in connection with the extension of credit to the Forest Conservation Districts needs special emphasis. Few of the owners of timber lands are in a position to draw up an adequate plan of development and management for their properties. On the other hand the Forest Service, with its vast experience and its highly trained personnel, is exceptionally well equipped to make such plans. For each Forest Conservation District, therefore, the Forest Service would present not only plans of management but an estimate of the total costs and a schedule of expenditures that are to be made from the loans of the Forest Credit Corporation. Thereafter the Forest Service will be in direct charge of these expenditures and of the management of the lands of districts subject only to the Forest Credit Corporation.

The actual operation of the Forest Credit Corporation may best be sketched by taking up serially the functions of the six divisions provided for in the structural arrangement of the system as noted above.

Registrars: In every large credit system someone is needed whose sole function it is to keep a close watch on the relationship of debt and underlying security and to be the custodian of such security as is hypothecated in the making of the loans. This then, would be the function of the Registrars.

Counsels: The need for legal counsel in an organization that would, if established, be as large as the Forest Credit Corporation, would be continuous. There is no need to give any lengthy description of functions—they would have charge of all legal matters.

Directors of Finance: The Directors of Finance would have under their care all accounting work not specifically assigned to other divisions. They would also supervise the issuing of debentures, the analysis of budgets and costs presented by the Forest Service or by private or municipal borrowers and they would have direct charge of the disbursing of funds loaned to borrowers.

Directors of District Organization and Coordination: To understand the functions of the Directors of District Organization and Coordination, one must first grasp the fact of the dual extension of credit by the Forest Credit Corporation to quasi-public Forest Conservation Districts on the one hand and to privately and municipally owned forests on the other. To grant credit of both types indiscriminately would result in the end in an undesirable hodge-podge of forest reserves and districts with each gerrymandered in relation to the other and with a consequent uneconomic use of both supervisory personnel and fire fighting and other mechanical equipment. To prevent such confusion there must be provided a means of enforcing coordination. This task would be the function of the director of this division.

Directors of Appraising and Timber Estimating: The Forest Credit Corporation must have a means not only of determining the initial values of all property upon which it is to make loans but it must have also a continuous check upon effectiveness of the subsequent management of these properties. It will be the function of the Directors of Appraising and Timber Estimating to supply the needed information. Forest Credit must be granted not so much upon the basis of present assets as upon the basis of projected and future income. The disbursement of funds to borrowers will often be over a period of ten, twenty or even thirty years before marketable timber will be available for income. Where plans of development have been poorly conceived or where management has been slipshod the constant checking of this Division should reveal the fact.

Directors of Private and Municipal Forest Credit: A large part of forest land and timber resources of the United States will and undoubtedly should remain in private ownership and under private management. Furthermore, there is a growing interest in state, county and even municipal forests. These not only need credit but, because some of the choicest forest lands in the country will remain in this type of ownership, extension of credit upon them should be one of the most acceptable parts of the business of the Forest Credit Corporation.

Credit will not be extended to these types of forests except under certain conditions. First, only when it will not interfere unreasonably with the formation of Forest Conservation Districts. Second, only to those who submit a plan of management and a budget of expenditures and third, only to those who agree to submit such additional information as the corporation sees fit to call for.

The costs of credit to the Forest Conservation Districts and to private and municipal borrowers will depend upon the rate at which debentures may be marketed. In recent years bonds of this kind used in Federal Land Bank financing were sold readily at three per cent. In addition to this three per cent debenture rate there would need to be a charge to defray the costs of operation of the Forest Credit Corporation itself. A charge of one per cent to pay costs of operation, is made by the Federal Land Bank upon their farm mortgage loans. A similar charge could be made in the present instance though dif-

ferences in costs may make possible a lesser charge, particularly to Forest Conservation Districts, as the loans will be small in number and large in amounts in contrast to the many small loans of the Federal Land Bank.

Costs of lending on private and municipal forests will probably be greater and more nearly commensurate with those of the Federal Land Banks. Therefore, though judgment in advance can hardly be conclusive, a charge of one per cent over the debenture rate (or a total of four per cent if the debenture rate is three per cent), would probably leave sufficient margin for defraying the costs of operation of the Corporation after it had been established and in operation long enough to have secured a considerable volume of business and income from its lending operations.

Little income from the repayment of its loans will, of course, be secured by the Corporation over the first twenty years of its life because of the nature and condition of the industry it is financing. Not only will the government need, therefore, to appropriate a considerable sum to establish the Corporation but permission will need to be given to the Corporation to borrow both for lending and for paying for its own costs. Indeed borrowing to pay costs of operation and interest may be necessary for a period of twenty to forty years.

The rise and retirement of debt for a typical forest Conservation District is illustrated in the chart below. Costs for the various items of protection and management are those given in the Copeland Report as representing experience in National Forest Management and are as follows: Protection 4.5 cents, timber management 1.9 cents, grazing management 1.2 cents, recreation management .6 cents, lands, administration .4 cents, improvements (capital investments) 1.9 cents, undistributed overhead .2 cents; total 10.7 cents. To these 10 cents an acre is added for payments to local governments in lieu of taxes, making the total cost 20.7 cents an acre.

The yield and income figures were also taken from the Copeland Report and represent estimated returns from a forest stand maintained upon a sustained yield basis. These data relate to about 350,000,000 acres of land in both public and private ownership, a part of the acreage under intensive and a part under extensive management. Returns are chiefly from timber sales, though there is a small amount from grazing, recreational and other uses.

The accumulation of costs and interest and the rise of debt is rapid in this typical or average District. It reaches almost exactly $2,000,000 in twenty years and about $2,600,000 in twenty-five years. Over a forty-year period $5,600,000 of debt would be built up.

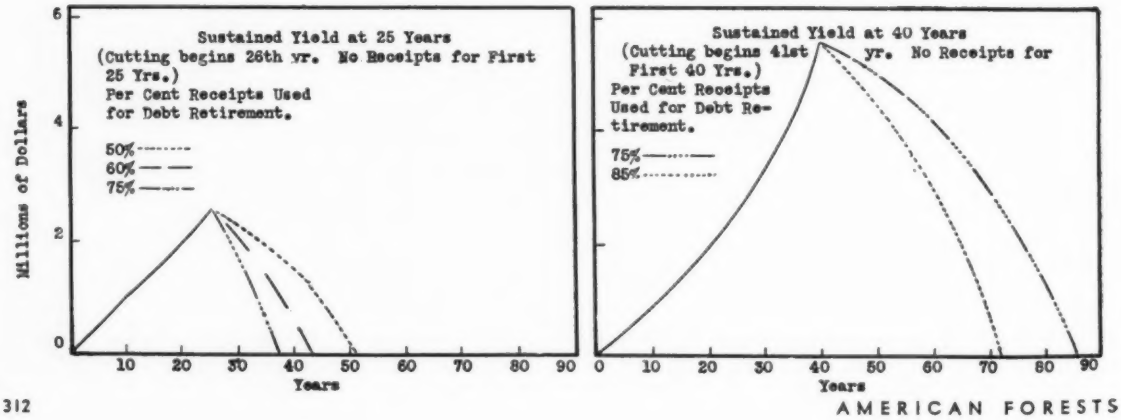
The rate of debt retirement depends in part on the portion of income to be used for that purpose. Furthermore, the longer the period of years needed to reach a sustained yield basis the greater the percentage of income subsequently needed to retire the accumulated costs and debt in a reasonable length of time. Thus for a District needing forty years to reach a sustained yield basis a mere fifty per cent of the income would not suffice and even with seventy-five per cent for debt service the retirement period would require thirty-two years or a total of seventy-two years altogether. Undoubtedly, there are millions of acres of forest land that will have so little income-producing power that a full one hundred per cent of the income from the first rotation after restoration is begun will be needed to retire the debt.

In conclusion it may be worthwhile to call attention to certain social and economic aspects of the program. Above all else it is designed to promote the practical and efficient growing of forests on a least cost basis. Forest restoration could not, however, even if it so wished, avoid serving other objectives as well, including the conservation of soil, water and wildlife.

The effective prosecution of the program will do much, both economically and socially, for many of our blighted areas. The rejuvenation of the wood-using industries in the Ozarks, Lake States and the Southern Appalachian areas would provide employment in areas now characterized by immense public relief loads. The creation of numerous Forest Conservation Districts would provide an opportunity for constructive use of relief, WPA and CCC labor on projects in which the government had a direct interest and which would be self-liquidating.

Lastly, the program promises much for land regulation. Valuable as the techniques of rural zoning and laws governing the reversion to public ownership of tax delinquent land are, they are unfortunately negative in outlook. That is they accomplish more to prevent an unwise use of land than they do in providing a proper use for it. There is no better way to stop the undesirable encroachment of agriculture on forest lands than to provide a means of interesting forest landowners in developing these lands for forestry. One does not need to zone lands that are in firm management and ownership hands. As for land tax delinquency: it is automatically eliminated for all lands entered in the Forest Conservation Districts.

RISE AND DECLINE OF DEBT, UNDER VARIOUS PRESUMED CONDITIONS, FOR A 200,000 ACRE FOREST CONSERVATION DISTRICT
A 4 Per Cent Interest Rate was Used in all Calculations



EDITORIAL

WHEN ECONOMY STRIKES

FOR A NUMBER of years it has become increasingly clear that the present scale of government spending for conservation cannot continue permanently and that sooner or later it must succumb to public pressure for federal and state economy. The process in action is already apparent in a number of states. A recent and clear-cut case is that of the Minnesota legislature, recently adjourned. In carrying out an economy program for the state, the legislature made a heavy cut in its conservation budget, singling out the work of protecting its forests from fire as the chief source of savings. State funds for fire protection were slashed almost twenty per cent.

It is proper that conservation should stand its fair burden of necessary retrenchment. Economy intelligently applied, however, need not hold or turn back conservation on its main and fundamental highways of progress if the public understands and has a clear perspective of the relative public importance of different forestry activities. The action of Minnesota illustrates either an absence of public clarity of work values or a deliberate willingness to gamble with fire. Minnesota is a state of high summer fire hazard. It has in the past been the scene of some of the country's worst forest fires. Adequate protection by state agencies is the most important and essential plank in the state's forestry program. Yet the legislature selected that activity for its greatest conservation saving despite the fact that previous state appropriations have been all too modest. Who is to blame—the public or the foresters?

What has happened in Minnesota contains a moral, we think, which all state and federal conservation leaders should not fail to note. The moral is that those conservation agencies which during lush years of easy money have been more intent upon spreading their activities into as many fields as possible than in programming their diversified works in the public mind in terms of relative public importance may expect economy like lightning to strike without rhyme or reason.

EXTENDING FOREST CREDIT

ELSEWHERE in this issue, A. H. Mussman and Conrad H. Hammar present a plan to provide credit for permanent forestry. Basic in their proposal is a scheme to regiment private forests into districts of about 200,000 acres each for management by the United States Forest Service. Private persons would continue to own the land, but the government would pay development and protection costs, reimbursing itself from later sales of stumpage and guaranteeing to owners a predetermined share of income.

With such a management set-up, the authors presuppose that the federal government could safely proceed to extend credit to these forest conservation districts and to individual owners. To handle such loans efficiently and at low costs, they outline with considerable detail an organization and method for extending forest credits.

Viewed simply as an agency for safely and efficiently extending loans to forest owners, this proposed credit structure deserves careful study. Something like it may be useful even though the lending of money for private forestry be begun on a very small scale, as many believe it should. The regimentation feature, however, is questionable, both as to its practicability and its need.

The authors evidently believe that failure of more private owners to practice forestry is due to innate contrariness rather than to business conservatism. Overlooking or dismissing possibilities inherent in what really is taking place in private forestry today, they base their plan on the faith that the federal government only has the ability to solve all our problems—a faith that all will not accept.

Under the plan, the Forest Service would manage all private forest lands—at a profit, of course—and also function as the recommending agency for indicating credit needs and spending programs. This appears to be a not too good dual role. Further, the government does not have a monopoly on forestry brains and forest management experience.

The first principle of forestry, private or public, is protection of resources and investments. By whomever done, protection still depends upon money for accomplishment. To scrap all existing state and private protection agencies in favor of federal, just when the leaven of local interest is beginning to work, appears highly dubious. It would accomplish no saving in cost to the public and might in fact increase the burden of public cost.

Although the federal government may not be able to buy a controlling interest in the private forests of the United States within the current century, the restoration of our private forests need not require more than two or three decades. Private forest rehabilitation is going ahead more rapidly today than ever before and permanent forest management will be accelerated as forest owners become convinced that reasonable protection of forests against natural enemies and public-caused fires is assured and that there will be a demand for their forest products. The factor of safety for the lender is less important at this stage of forest credits than is the forest owner's fear of borrowing without reasonable assurance of recovering his investment.

EASTERN COTTONWOOD

***Populus deltoides*, Marsh**

BY G. H. COLLINGWOOD

THE BROAD spreading crown of eastern cottonwood is common from Quebec to northern Florida and west along the upper streams leading into the Great Plains. Most frequently found along water courses, it often forms extensive groves in the north and west.

Developing first a narrow, conical crown, with maturity it becomes broad and open, supported by a massive trunk often divided near the ground. Under forest conditions the bole may reach fifty to sixty feet to the main limbs. Ordinarily, eighty to 100 feet tall and three to four feet in diameter, under favorable conditions west of the Mississippi, trees attain heights of 150 feet and diameters of seven to eight feet.

The poplars are of ancient origin and the name *populus* may refer to an early Roman expression *arbor populi,* the people's tree. Of some twenty-five species recognized throughout the world, eleven are found in North America. Of these *deltoides,* with its delta shaped leaf, is the most important eastern representative.

The bright green, glossy, leathery leaves are broad and triangular, with coarse, rounded, marginal teeth and a flattened stem or petiole about as long as the leaf blade. Together they are four to seven inches long. The shiny brown terminal buds are resin-covered and like the crushed leaves have a pleasant balsamic odor.

Flowers of both sexes are borne separately on different trees and appear in March or April before the leaves unfold as three to five inch drooping catkins. By May the more loosely flowered pistillate catkins are six to eleven inches long, with scattered, pointed capsules which expel the tiny, fragile seeds whose attached fibres of fluffy white down carry them long distances. A few hours must bring them to some place of exposed mineral soil such as that on recently flooded banks and river islands or their vitality is lost. Cottonwood also reproduces from stumps and root sprouts and may be readily grown

Cottonwood with its wide spreading open crown is familiar to the open plains and prairies

The bright green, leathery, broadly triangular leaves, together with the stems, are four to seven inches long

Winter reveals the short trunk and vigorous growth of limbs and branches

from cuttings. The deeply fissured bark of mature trees is a dull gray to brown, two to three inches thick, with rather wide ridges. On young trunks and branches it is smooth, thin, and grayish yellow tinged with green.

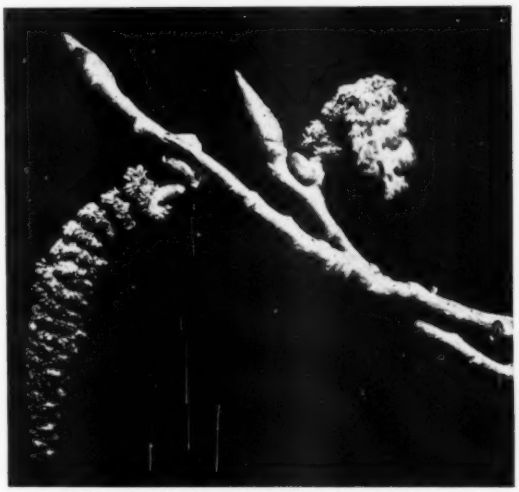
The wood is of varied shades of brown with a thick white margin of sapwood. It is close grained and porous, with a dull luster, soft, weak, usually easy to work, but warps badly in seasoning. A cubic foot when air dry weighs about twenty-four pounds and is almost devoid of taste or odor. It is used largely for boxes, crates, packing cases, excelsior, core for veneers, paper pulp, and locally for poles, posts, and fuel.

In 1932 the stand of eastern cottonwood and aspen saw-timber was estimated to be 4,437,000,000 board feet, but the steady reduction of annual output indicates a failing supply. Production in 1937 was 135,801,000 board feet with Mississippi, Arkansas, Louisiana, and Minnesota responsible for nearly two-thirds of the cut.

Cottonwood is remarkable for its rapid growth, but height growth declines soon after forty years. Thereafter trees may remain sound and vigorous, but growing slowly, for 100 years or more. Trees have been observed to grow four to five feet in height each year and with diameters increasing two-thirds of an inch for the first twenty-five years. Others reached 100 feet in height in fifteen years.

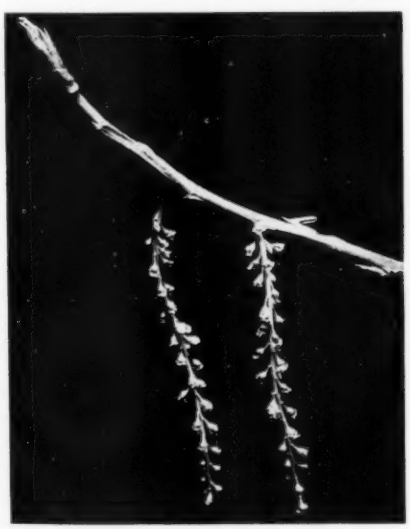
Frequently planted for shelter and ornament in the treeless plains and prairies west of the Mississippi, the wide spread, shallow root system which helps make the tree wind-firm, often upheaves sidewalks. Moreover, the tiny rootlets fill drain pipes in their search for water. Accordingly, many towns and cities prohibit the planting of cottonwood within their boundaries.

Fire is destructive until after the young trees are fifteen or twenty years old and the bark thick enough to resist the heat. The low overflow lands on which most cottonwoods grow is their chief source of protection. Various fungus diseases are more to be feared, and during the first few years the young shoots are eagerly eaten by field mice, rabbits, and cattle.

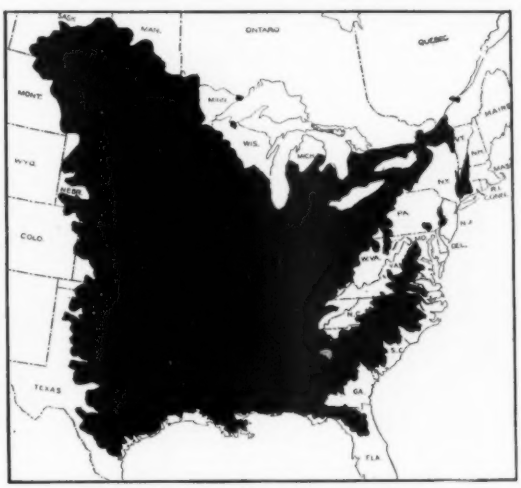


The densely flowered, pollen bearing staminate catkins are three to five inches long

The mature bark is dark gray to brown with deep fissures and rounded ridges



Long strands of capsule fruits cause the name "Necklace" poplar



Natural range of Eastern Cottonwood

The Farmer as a Conservationist

(*Continued from page* 299)

this, we need fear no indifference to the welfare of bushes, or birds, or soil, or trees. We shall then have no need of the word conservation, for we shall have the thing itself.

The landscape of any farm is the owner's portrait of himself.

Conservation implies self-expression in that landscape, rather than blind compliance with economic dogma. What kinds of self-expression will one day be possible in the landscape of a cornbelt farm? What will conservation look like when transplanted from the convention hall to the fields and woods?

Begin with the creek: it will be unstraightened. The future farmer would no more mutilate his creek than his own face. If he has inherited a straightened creek, it will be "explained" to visitors, like a pock-mark or a wooden leg.

The creek banks are wooded and ungrazed. In the woods, young straight timber-bearing trees predominate, but there is also a sprinkling of hollow-limbed veterans left for the owls and squirrels, and of down logs left for the coons and fur-bearers. On the edge of the woods are a few wide-spreading hickories and walnuts for nutting. Many things are expected of this creek and its woods: cordwood, posts, and sawlogs; flood-control, fishing and swimming; nuts and wildflowers; fur and feather. Should it fail to yield an owl-hoot or a mess of quail on demand, or a bunch of sweet william or a coon-hunt in season, the matter will be cause for injured pride and family scrutiny, like a check marked "no funds."

Visitors when taken to the woods often ask, "Don't the owls eat your chickens?" Our farmer knows this is coming. For answer, he walks over to a leafy white oak and picks up one of the pellets dropped by the roosting owls. He shows the visitor how to tear apart the matted felt of mouse and rabbit fur, how to find inside the whitened skulls and teeth of the bird's prey. "See any chickens?" he asks. Then he explains that his owls are valuable to him, not only for killing mice, but for excluding other owls which *might* eat chickens. His owls get a few quail and many rabbits, but these, he thinks, can be spared.

The fields and pastures of this farm, like its sons and daughters, are a mixture of wild and tame attributes, all built on a foundation of good health. The health of the fields is their fertility. On the parlor wall, where the embroidered "God Bless Our Home" used to hang in exploitation days, hangs a chart of the farm's soil analyses. The farmer is proud that all his soil graphs point upward, that he has no check dams or terraces, and needs none. He speaks sympathetically of his neighbor who has the misfortune of harboring a gully, and who was forced to call in the CCC. The neighbor's check dams are a regrettable badge of awkward conduct, like a crutch.

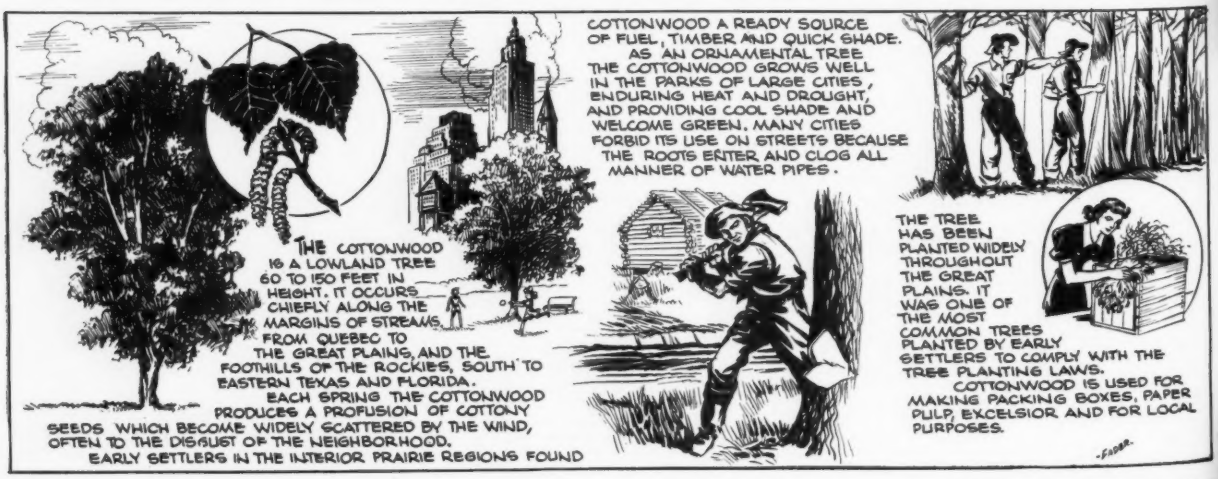
Separating the fields are fencerows which represent a happy balance between gain in wildlife and loss in plowland. The fencerows are not cleaned yearly, neither are they allowed to grow indefinitely. In addition to bird song and scenery, quail and pheasants, they yield prairie flowers, wild grapes, raspberries, plums, hazelnuts, and here and there a hickory beyond the reach of the woodlot squirrels. It is a point of pride to use electric fences only for temporary enclosures.

Around the farmstead are historic oaks which are cherished with both pride and skill. That the June beetles once got one is remembered as a slip in pasture management, not to be repeated. The farmer has opinions about the age of his oaks, and their relation to local history. It is a matter of neighborhood debate whose oaks are most clearly relics of oak-opening days, whether the healed scar on the base of one tree is the result of a prairie fire or a pioneer's trash pile.

Martin house and feeding station, wildflower bed and old orchard go with the farmstead as a matter of course. The old orchard yields some apples but mostly birds. The bird list for the farm is 161 species. One neighbor claims 165, but there is reason to suspect he is fudging. He drained his pond; how could he possibly have 165?

His pond is our farmer's special badge of distinction. Stock is allowed to water at one end only; the rest of the shore is fenced off for the ducks, rails, redwings, gallinules, and muskrats. Last spring, by judicious baiting and decoys, two hundred ducks were induced to rest there a full month. In August, yellow-legs use the bare mud of the water-gap. In September the pond yields an armful of waterlilies. In the winter there is skating for the youngsters, and a neat dozen of rat-pelts for the boys' pin-money. The farmer remembers a contractor who once tried to talk drain- (*Continuing on page* 323)

TREES AND THEIR USES—No. 42— EASTERN COTTONWOOD


THE COTTONWOOD IS A LOWLAND TREE 60 TO 150 FEET IN HEIGHT. IT OCCURS CHIEFLY ALONG THE MARGINS OF STREAMS FROM QUEBEC TO THE GREAT PLAINS, AND THE FOOTHILLS OF THE ROCKIES, SOUTH TO EASTERN TEXAS AND FLORIDA.
EACH SPRING THE COTTONWOOD PRODUCES A PROFUSION OF COTTONY SEEDS WHICH BECOME WIDELY SCATTERED BY THE WIND, OFTEN TO THE DISGUST OF THE NEIGHBORHOOD.
EARLY SETTLERS IN THE INTERIOR PRAIRIE REGIONS FOUND COTTONWOOD A READY SOURCE OF FUEL, TIMBER AND QUICK SHADE.
AS AN ORNAMENTAL TREE THE COTTONWOOD GROWS WELL IN THE PARKS OF LARGE CITIES, ENDURING HEAT AND DROUGHT, AND PROVIDING COOL SHADE AND WELCOME GREEN. MANY CITIES FORBID ITS USE ON STREETS BECAUSE THE ROOTS ENTER AND CLOG ALL MANNER OF WATER PIPES.
THE TREE HAS BEEN PLANTED WIDELY THROUGHOUT THE GREAT PLAINS. IT WAS ONE OF THE MOST COMMON TREES PLANTED BY EARLY SETTLERS TO COMPLY WITH THE TREE PLANTING LAWS.
COTTONWOOD IS USED FOR MAKING PACKING BOXES, PAPER PULP, EXCELSIOR AND FOR LOCAL PURPOSES.
-FADER.

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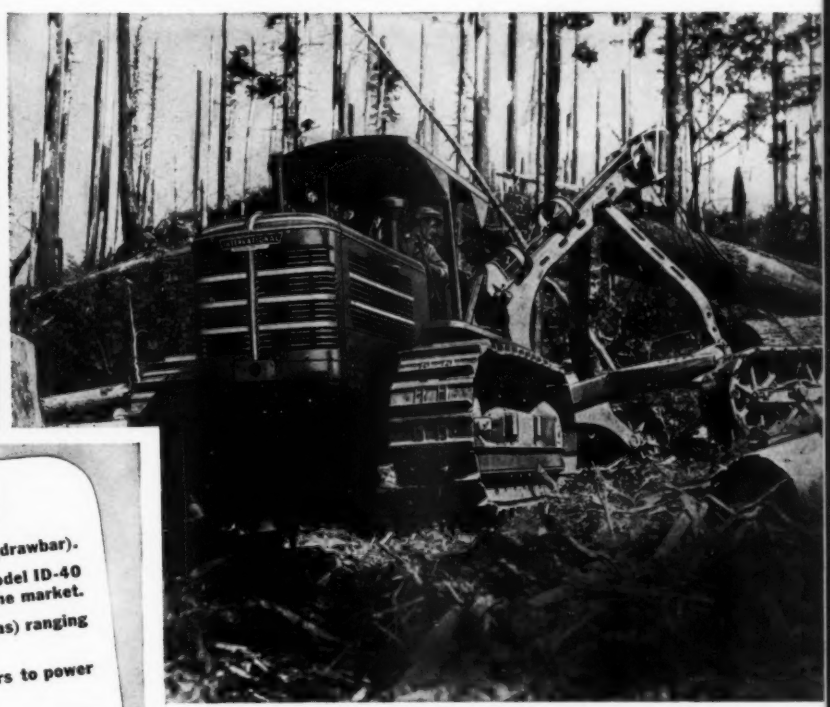

Here is the new International TD-18 Diesel TracTracTor skidding with a logging arch. This powerful 70 h.p. crawler has features you have always wanted in a crawler tractor. Ask for a demonstration and see for yourself.

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INTERNATIONAL INDUSTRIAL POWER

Carlos Campbell

Protected, black bears are now seen along the highways in the Great Smoky Mountains National Park

ANIMALS INCREASING IN THE GREAT SMOKIES

By Carlos C. Campbell

WITH the formal dedication of the Great Smoky Mountains National Park, in Tennessee and North Carolina, scheduled for June 22, it is interesting to look at the wildlife of the region and to note the transformation that has recently taken place.

Those familiar with the Great Smokies prior to the establishment of the park in 1931 knew it to be an area popular with hunters, particularly those who sought bear, deer, wild turkey, ruffed grouse and other smaller game. To what extent these birds and animals were killed off or driven out by the hunters was difficult to determine because of the wilderness character of these high, rugged mountains. However, when the park was established and rangers began enforcing the non-hunting regulation, it was estimated that not more than a score of deer remained in the region. Bears and other game undoubtedly fared better, but hikers who went into the mountains in the early days of the park often remarked about the scarcity of game animals and birds.

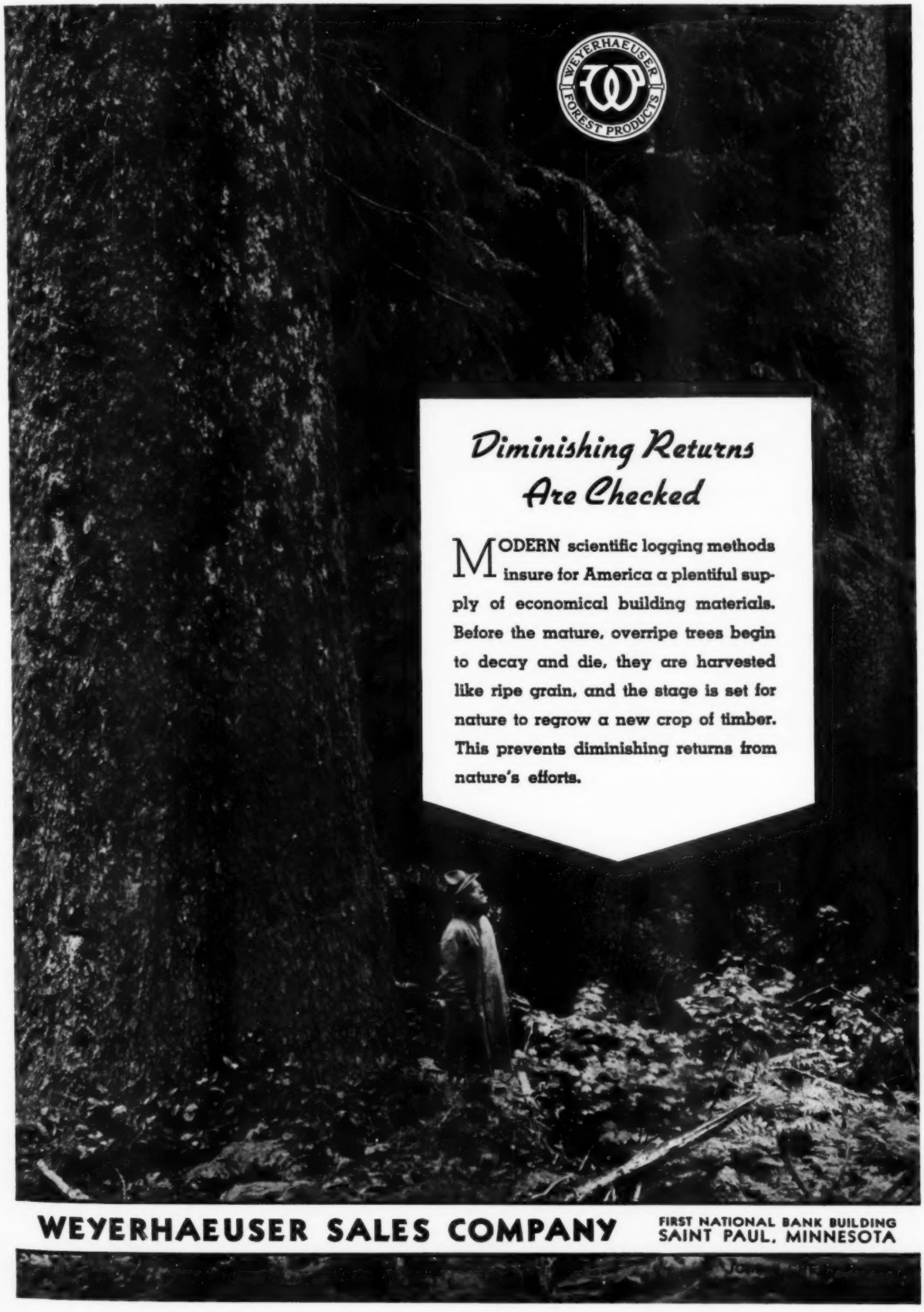
That there was a scarcity is quite evident, but it now appears that there were more game animals and birds than first supposed. Anyway, wildlife, under the protection offered by the National Park Service, is increasing in the Great Smoky Mountains National Park. While five or six years ago visitors were complaining about not seeing wildlife, it is now almost a daily occurrence for motorists driving leisurely along the park road that crosses the mountain, or along the short spur road that runs along the crest to Clingmans Dome, to see two or more black bears scampering playfully along the edge of the dense forest. Usually these bears get quickly out of sight, but increasingly frequent reports tell of them paying little attention to the visitors.

This lack of fear of man is undoubtedly being brought about by protection—and the ease of obtaining food. Although a park regulation prohibits the feeding of bears by visitors, it is a regulation that cannot be rigidly enforced, and is therefore often violated. Anyway, it is becoming more and more apparent that many of these roadside bears expect to be fed when the visitor approaches; and on several occasions visitors have been bitten and scratched while attempting to feed the animals. In some sections of the park the bears have become so bold that it has been necessary for park officials to drive them away from the roads by frightening them. If this does not produce the desired results, officials are considering trapping the chief offenders and removing them to remote sections of the park. For while officials want the animals where park visitors may see them, they will not be permitted to become common panhandlers. To help achieve this end, feeding pits for bears are barred in the park.

Back away from the roads the bears and other forms of wildlife have not become quite so tame, although park visitors report they are more numerous and frequently seen. The red squirrel, or boomer, as mountain people call him, until recently was known mostly by his saucy barking from tree-tops. Few visitors were ever able to see him. Now it is relatively easy to approach within a few feet of the little fellow, especially at camp sites and other spots where park visitors frequently eat their lunches. A few years ago when hikers came suddenly upon an occasional ruffed grouse they were fortunate if they saw anything more than a blurred streak through the forest, to the accompaniment of a loud roar made by the rapid wing beats of the flying bird. Now, it is not uncommon to have one or perhaps two of these graceful birds stand, statuesque-like, before the visitor, or to walk unconcernedly away. Wild turkeys are a bit more wary, but may be occasionally observed at close range. Groups of from five to thirty have been reported during the past season.

Because the deer had been so nearly extinguished from the area, their increase in numbers and an evidence of their reaction to park protection is much slower than that noted in other forms of wildlife. Even so, a few deer have recently been reported in sections of the park where they had not been seen for scores of years. It is believed that within a few more years they will become almost as plentiful, and as tame, as are the bears today.

As a result of the protection given to wildlife in the Great Smoky Mountains National Park, it will be possible in the future for park visitors to get many thrills missed by visitors to these mountains a few years ago.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SEE AD ON PAGE 325

Maryland Approves Purchase Program

THE acquisition of additional forest and park land for Maryland is assured under a $100,000 bond issue recently passed by the State Legislature for "acquisition, development, and improvement of state forests, parks, and recreational areas," according to a recent announcement by State Forester F. W. Besley. While providing for the acquisition of additional land, the authorization will also allow a considerable amount of improvement work on existing areas.

That this may revive a thirty-year old plan for an inter-city forest area between Washington and Baltimore is the hope of the Committee on Planning and Forestry of the Maryland Outdoor Life Federation. In a recently revised report, the committee recommended a two-year program in which the 60,000 acres of state forests be increased by the purchase of an additional 50,000 acres at an estimated cost of $150,000, and that some 12,500 acres of state parks, now in the course of development, be increased by the purchase of 5,000 acres at an estimated cost of $50,000.

"We have now reached the point," declared the committee, "where work on public lands is so nearly completed that unless we can acquire new lands speedily, we will lose the remaining CCC forest and park camps which have already been cut from seventeen to eight. It is imperative that we acquire at least 50,000 acres of forest and park lands within the next two years to hold the CCC camps we now have."

Work under authority of the bond issue will begin during the summer with part of the $100,000 to be available by August 15. The remainder is expected to be available by February, 1940.

Two New Game Ranges in Arizona

THE Kofa and Cabeza Prieta game ranges in Arizona, recently established by executive order of President Roosevelt, have added more than a million and a half acres to the federal areas devoted to wildlife conservation, says the Biological Survey. Set apart primarily as refuges for mountain sheep, or bighorns, the two ranges will also afford protection and security to other species of wildlife. Among these are antelope, peccaries, mule deer, and Gambel quail.

Kofa range is in Yuma County of southwestern Arizona. The Cabeza Prieta embraces parts of Yuma and Pima counties and borders on the Mexican state of Sonora. Both lie in some of the most arid country in the United States, desert land with rugged mountains reaching to heights of more than 4,000 feet.

Comprising 661,120 acres, the Kofa area is rectangular in shape, thirty miles across at its widest point and more than forty miles from north to south. The range is crossed diagonally by two mountain ranges, the Kofa range in the north and the Castle Dome mountains in the southern part. In between lies La Posa plain.

Thirty-five miles south of Kofa Range, the Cabeza Prieta extends eastward for fifty miles with forty-five miles neighboring on the Mexican border. This area includes 866,880 acres. Also characterized by mountain and plain, the Cabeza Prieta is more arid and the mountains less precipitous, though greater in number. Separated by wide flat land and valleys, the mountains include parts of Cabeza Prieta, Sierra Pinta, Mohawk, Granite, Agua Dulce, Growler and Little Ajo ranges.

The proximity of the Cabeza Prieta Game Range to the Mexican border lends an unusual international interest. Already negotiations are pending with the Mexican government for the establishment of a similar game range adjoining and south of the border.

The setting apart of these two ranges, says the Biological Survey, is of particular interest to all who are vitally concerned with the preservation of native American wildlife. A few years ago this section abounded in game, but indiscriminate hunting and poaching came dangerously close to eliminating some of the most valuable species.

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No. 1—Flathead-Sun River Wilderness, Montana
July 3 to July 15.

No. 2—Sawtooth Wilderness, Idaho
July 18 to July 31.

No. 3—Gila Wilderness, New Mexico
August 1 to August 13.

No. 4—Maroon Bells-Snowmass Wilderness, Colorado
August 3 to August 16.

No. 5—Kings River Wilderness, California
August 20 to September 1.

All expeditions are carefully organized with experienced guides, packers, wranglers and cooks. A physician is with each party; so are representatives of The American Forestry Association and the United States Forest Service. Both riding and pack horses are thoroughly trained to mountain travel. Costs run around $10 a day—no more than you would spend on any other vacation. So make this your year to ride with the Trail Riders of the Wilderness—an experience you will never forget. Write for reservations and detailed information concerning the expeditions.

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UNDER DIRECTION of SIDNEY BANKS

Arkansas and Alabama Appoint New Foresters; Foster Resigns in Minnesota

ANNOUNCEMENT has been made of the appointment of Fred H. Long as state forester of Arkansas to succeed Charles A. Gillett, who becomes industrial forester for the Seaboard Railway, and of the naming of Brooks Toler as state forester of Alabama, succeeding Page S. Bunker. Mr. Long had served as assistant state forester of Arkansas since 1937, and Mr. Toler, prior to his new appointment, was extension forester of Mississippi. At the same time Ellery A. Foster, director of forestry in Minnesota since 1937, announced that he had tendered his resignation to Governor H. E. Stassen.

In the federal Forest Service, Chief Forester F. A. Silcox announced that C. J. Buck, regional forester of the North Pacific Region with headquarters in Portland, Oregon, has been transferred to the Washington office of the Forest Service in the capacity of general inspector and special assistant to the chief. Mr. Buck is succeeded as regional forester at Portland by Lyle F. Watts, for the past several years regional forester of the North Central Region, with headquarters at Milwaukee, Wisconsin. Succeeding Mr. Watts at Milwaukee is Jay H. Price, until his new appointment associate regional forester of the California Region, with headquarters at San Francisco.

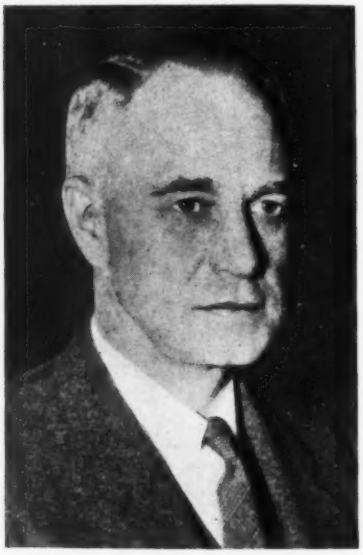
In Minnesota, Mr. Foster tendered his resignation to Governor Stassen because the recent state legislature had slashed forestry appropriations for the coming biennium from $730,000 to $598,000. "The leadership in the recent legislature," Mr. Foster declared, "apparently was ready to give no more than lip service to forest conservation when it came to provide the actual means of putting a sound program into effect." Fire protection which was cut a total of $116,500 involves a serious threat to the safety of northern Minnesota and the reduction was described as "the shallowest kind of false economy." The reductions were made despite departmental recommendations that appropriations be increased from $730,000 as for 1937-39 to $1,209,410 for 1939-41, with a total of $873,300 for forest protection.

"Forest fire protection in our state," continued Mr. Foster, "has never been adequately financed, and the reduced budget means that most of the lookout towers will go unmanned, so that the field men will be unable to discover and put fires out while they are still small. Minnesota's sadly underpaid staff of rangers and other forestry employees will have to take layoffs and reductions in seasonal employment, further crippling their important work. Federal contributions to fire protection, totaling about $100,000 in the current year, probably will be reduced."

Appropriations for forest nursery maintenance were reduced from $13,000 to $10,500 and all funds for white pine blister rust control wiped out. In addition, reduced appropriations for management of state forest lands, Mr. Foster states, will stop proposed timber sales that might provide employment for 4,000 men.

"Thus," concluded Mr. Foster, "Minnesota stands to lose through forest fires, through the dying and rotting of timber that should be sold to create wealth, and through the loss of four dollars to twenty dollars of federal conservation aids for every dollar of 'savings' in state appropriations."

Mr. Foster's resignation followed closely the Governor's order of April 26 suspending Commissioner of Conservation Herman C. Wenzel on charges of malfeasance and misfeasance. Commissioner Wenzel, who was appointed on July 1, 1937, by Governor Elmer A. Benson for a six-year term, succeeding the former five-man conservation commission, was accused of having approved and condoned illegal purchases and the unlawful expenditure of state funds upon illegal contracts; of maintaining individuals on the state payroll who are not performing duties for the Department of Conservation or for the state government; of having exacted assessments from employees in the Department and so destroying their morale.



JAY H. PRICE
New Regional Chief for Forest Service

Mr. Foster stated that he dislikes to leave Commissioner Wenzel while he is under fire or pending the public hearing scheduled for May 22. Declaring that he has found Commissioner Wenzel "an efficient public servant, honestly devoted to the best interests of the state," he continued, "I believe you will find that there have been no irregularities greater than would be found in any large department handling a wide variety of activities and funds. I propose to stand by him until the matter of his suspension is cleared up."

The Farmer as a Conservationist

(*Continued from page* 316)

age. Pondless farms, he says, were the fashion in those days; even the Agricultural College fell for the idea of making land by wasting water. But in the drouths of the thirties, when the wells went dry, everybody learned that water, like roads and schools, is community property. You can't hurry water down the creek without hurting the creek, the neighbors, and yourself.

The roadside fronting the farm is regarded as a refuge for the prairie flora; the educational museum where the soils and plants of pre-settlement days are preserved. When the professors from the college want a sample of virgin prairie soil, they know they can get it here. To keep this roadside in prairie, it is cleaned annually, always by burning, never by mowing or cutting. The farmer tells a funny story of a highway engineer who once started to grade the cutbanks all the way back to the fence. It developed that the poor engineer, despite his college education, had never learned the difference between a silphium and a sunflower. He knew his sines and cosines, but he had never heard of the plant succession. He couldn't understand that to tear out all of the prairie sod would convert the whole roadside into an eyesore of quack and thistle.

In the clover field fronting the road is a huge glacial erratic of pink granite. Every year, when the geology teacher brings her class out to look at it, our farmer tells how once, on a vacation trip, he matched a chip of the boulder to its parent ledge, two hundred miles to the north. This starts him on a little oration on glaciers; how the ice gave him not only the rock, but also the pond, and the gravel pit where the kingfisher and the bank swallows nest. He tells how a powder salesman once asked for permission to blow up the old rock "as a demonstration in modern methods." He does not have to explain his little joke to the children.

He is a reminiscent fellow, this farmer. Get him wound up and you will hear many a curious tidbit of rural history. He will tell you of the mad decade when they taught economics in the local kindergarten, but the college president couldn't tell a bluebird from a blue cohosh. Everybody worried about getting his share; nobody worried about doing his bit. One farm washed down the river, to be dredged out of the Mississippi at another farmer's expense. Tame crops were over-produced, but nobody had room for wild crops. "It's a wonder this farm came out of it without a concrete creek and a Chinese elm on the lawn." This is his whimsical way of describing the early fumblings for "conservation."

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ASK THE FORESTER

Forestry Questions Submitted to The American Forestry Association, 919 - 17th St., N. W., Washington, D. C., Will Be Answered in This Column . . . . A Self-Addressed Stamped Envelope Should Accompany Your Letter.

QUESTION: Last year the writer purchased one *Cladrastis Lutea* (Yellow-Wood). The tree when received was about 7 feet high. It seems to be doing well except the branches at the top of the specimen sent me spread so much as to form what seems to me dangerous crotches, in that any snow load or any other heavy weight would break the tree at the crotch. What possibly can be done to prevent the spreading branch habit of this tree, and also a few notes on the best kind of land it can be planted on, and what fertilizers had best be used?—R. A. P., Connecticut.

ANSWER: Throughout the parks of Washington, D. C., and in the woods of North Carolina this tree invariably branches low and forms a broad spreading crown. The broad crotches and the wide spreading limbs develop a rather flat contour characteristic of the Yellow-Wood, or Virgilia tree. It will probably be impossible to correct this tendency to form broad crotches which may break under a snow load. The tree is reported to prefer limestone ridges and slopes, and sometimes overhangs the banks of mountain streams, but in Washington it grows and thrives in almost any moist, well drained soil.

A 10-20-10 fertilizer at the rate of one-half pound for each diameter inch of the trunk taken at about four feet from the ground is suggested. In applying this, draw a rough circle on the ground under the outside limits of the branches and another circle two-thirds of the way in towards the trunk. Within this area, bounded by the two circles, holes twelve or fifteen inches deep can be dug with a crow bar or saw auger and two and one-half to four ounces of fertilizer poured into each hole. The holes should not be more than three feet apart and preferably closer. Top dirt may be used to fill the hole to the normal surface.

Ordinary fertilizing of this type can be done during the spring or early summer and is usually more desirable than if it is done in the late summer or fall.

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The action picture shows Indians going into action at a forest fire in Pine Lawn, L. I. The State of Connecticut has equipped all their Forest Service Trucks with Indians, as shown in the view at left.

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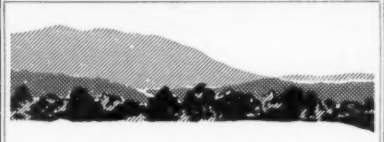

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FORESTRY IN CONGRESS

By G. H. Collingwood

Transfer to the Department of the Interior of the Biological Survey from the Department of Agriculture, and of the Bureau of Fisheries, together with its responsibilities for the protection of fur seals, and the Whaling Treaty Act from the Department of Commerce, is assured in Reorganization Plan Number Two, as transmitted to Congress May 9 by the President, and approved by the Senate on May 12.

"These two bureaus have to do with the conservation and utilization of the wildlife resources of the country, terrestrial and aquatic," declared the President in a long message to Congress which accompanied the plan. "Therefore, they should be grouped under the same departmental administration, and in that department which, more than any other, is directly responsible for the administration and conservation of the public domain. However, I intend to direct that the facilities of the Department of Agriculture shall continue to be used for research studies which have to do with the protection of domestic animals from diseases of wildlife, and also where most economical for the protection to farmers and stockmen against predatory animals."

With administrative expenses of some twenty agencies affected by the plan totaling about $25,000,000, the President estimates probable annual reductions of $1,250,000, or five per cent of the yearly costs. Accordingly, with current appropriations for the Biological Survey of $3,873,340 and $2,108,000 for the Bureau of Fisheries, the reduced expenses for the two bureaus may approximate $300,000.

"In view of the fact that it is now May 9," the President continued, "and that any reorganization plan must lie before the Congress for sixty calendar days, and because the reorganizations of an intra-departmental character require a great deal of research and careful, painstaking, detailed work, I do not propose to send any further general reorganization plans to the Congress at this session."

Without making direct reference to the Forest Service, the President clearly indicated his intention to consider this bureau in a reorganization order to follow early in the next session of this Congress. In his message, he said, "I have also considered the problem of certain public lands so far as they present over-lapping jurisdiction between the Departments of the Interior and Agriculture.

"In so far as crops, including tree crops, are involved there is something to be said for their retention in the Department of Agriculture. But where lands are to be kept for the primary purpose of recreation and permanent public use and conservation, they fall more logically into the Department of the Interior.

"I hope," he concluded, "to offer a reorganization plan on this early in the next session."

Reorganization Order Number One, which the President submitted on April 25, is without effective opposition in Congress, since the House on May 3 rejected Representative Taber's Concurrent Resolution of disapproval. The Reorganization Act of March 19, 1939, provides that each plan will become effective after sixty days unless concurrent resolutions of disapproval are passed by both legislative bodies. Favorable action on Senator Byrnes' S. J. Res. 138, however, would make both plans effective by July 1.

Under this order the Civilian Conservation Corps—because "its major purpose is to promote the welfare and further the training of the individuals who make up the corps, important as may be the construction work which they have carried on so successfully"—will lose its independent status and be in the new Federal Security Agency. The National Resources Committee is to become the National Resources Planning Board and with the Bureau of the Budget is attached to the President's Office. The Bureau of Public Roads now in the Department of Agriculture will be changed to the Public Roads Administration and together with the Branch of Buildings Management of the Park Service will be assembled under a Federal Works Agency. Anticipated economies are between $15,000,000 and $20,000,000 annually.

The Senate on May 12 passed an amended Agricultural Appropriation bill, H. R. 5269, with $22,020,285 for the Forest Service. This increase of $4,273,306 over the amount approved by the House on March 28 includes an additional $500,000, or a total of $2,500,000 for cooperative forest fire prevention. The Senate also added $34,246, under national forest protection and management with which to establish a crew of forty specially trained men available to fight fires within several hundred miles from an established base. An added $250,000 makes $750,000 available for white pine blister rust control on national forests.

The fight for America's elms resulted in the inclusion of $500,000 for Dutch elm disease eradication with authority to use portions of this appropriation for the control "of virus disease of the trees prevalent in the Ohio Valley."

Greatest of all Forest Service gains was $4,000,000 to make a total of $5,000,000 for forest acquisition and $325,000 to acquire some 20,000 acres for the Tahoe National Forest in Nevada.

An addition of $71,639 restores the Budget estimate of $700,000 for the Forest Products Laboratory and provides further research in the field of wood construction for low-cost housing.

Restoration of $55,000 gives the forest experiment stations $648,403 with $20,000 "ear-marked" for lowland hardwood studies in the lower Mississippi River Basin. Of the remainder of the increase $10,000 is for studies in forest genetics looking to the production of trees having faster growth, more resistance to disease and insects, and better form; $10,000 to study methods of restocking denuded forest lands; and $10,000 to study the rate of growth of timber stands. A new item of $30,000 was included for a Tropical Forest Experiment Station in Puerto Rico.

An addition of $20,000 for studies in reseeding and revegetating range lands in California and the Great Basin brings the total for range investigations to $245,935, while $28,000 increases that for forest economics to $149,295 to survey possibilities of unemployment relief through forestry in northeastern Pennsylvania, and investigate improved management practices in southern forests.

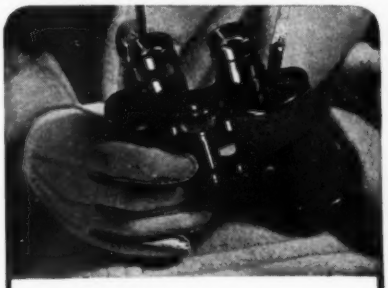
Cooperative farm forestry as financed under the Norris-Doxey Act, and administered by the Soil Conservation Service in cooperation with the Forest Service, was increased from $300,000 to $400,000. In addition, the Senate restored the Forest Service item for cooperative distribution of forest planting stock from $70,579 to $100,000 and increased that for farm forestry extension work from $56,838 to $100,000.

Supplemental to other Forest Service items, the Senate added $4,000,000 to maintain appropriations for forest roads and trails at $14,000,000.

The Bureau of Entomology and Plant Quarantine received increases of $375,000 for gypsy and brown-tail moth control, and $53,100 to restore forest insect studies to the current year's appropriation of $253,100. To the Bureau of Plant Industry went an additional $10,000 to study the London plane tree disease and give forest pathology a total of $265,392.

The Biological Survey appropriation is increased from $3,973,691 to $4,653,691. This adds $500,000 for use as federal aid in wildlife restoration, to make a total of $2,000,000. Under the Pittman-Robertson Act of 1937 this is covered by federal taxes on firearms, shells, and cartridges, receipts from which for the fiscal year 1938 were $2,826,973.06. The increase also includes $100,000 to make a total of $750,000 for predatory animal control, and $80,000 to make $680,000 for the maintenance of wildlife reservations.

On May 2, the Senate passed Senator Barkley's S. 685, to authorize a Division of Stream Pollution in the Public Health Service, with power to survey and investigate stream pollution throughout the country; to work out plans of cooperation with states and communities, and to make loans and grants-in-aid to those who discharge untreated or inadequately treated sewage or waste into navigable waters.



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THE RANGER'S CORNER

My introduction to the buffalo was when I first laid eyes on an overcoat my father wore back in the late 70's and early 80's. It was a buffalo coat. Buffalo robes, I remember also, were a part of his equipment for winter travel, and to be tucked under one of them in a sleigh during sub-zero weather in northern Iowa and South Dakota was a cozy and comfortable feeling.

But the 70's and 80's witnessed the rapid demise of the American buffalo and father's overcoat looked pretty patchy and bare before he discarded it for one made of coonskin. By the time the present century rolled around this species of the genus *Bos* was at a point just this side of extinction. That the buffalo was brought back to number more than 20,000 today is a story familiar to almost everyone. But what is not so generally known is the fact that while the herds today are largely within fences, civilization seems not to have tamed them in any degree.

I would like to give you an example. Down in southwestern Oklahoma, in a land of wheat, cotton, kaffir, cattle and oil, in a domain of ex-Indian reservations and genial hospitable folks, is a bit of Uncle Sam's country now known as the Wichita Federal Game Preserve. Buffalo are there in a buffalo-proof enclosure—one of the finest herds remaining on the American continent. An initial planting in 1907 of fifteen animals, a contribution from the New York Zoological Park, and their careful management over a period of more than thirty years are responsible for this superb herd of some 300 animals.

In the fall of 1926 there was to be a celebration at Lawrence, Kansas, and the officials asked for several of the sprightliest and snortiest specimens to grace the big pioneer doings. Indians from states around set up their tepees; old timers of covered wagon days and fame were there; government dignitaries from Washington came to recall the days of the Santa Fe Trail, of Fremont, and the conquering of the West. I was in on the wrapping up of a package of four sleek and vicious cows that could be spared and that would do justice to any barbecue or celebration.

Sunday morning dawned bright and fair and with torrid forebodings such as the Wichita country can supply most generously. The forest ranger and his assistant had our horses ready as we finished a delightful breakfast with Mr. and Mrs. Forest Supervisor. I was assigned "Old Bill," a splendid bay, noted from experience for his sagacity in herding buffalo or eluding them. A friend was given a trim gray and the supervisor and his men rode their regular mounts—all strong, swift, wiry animals, ready for supreme test of endurance. They kept the horses grained regularly, although it was used only intermittently with the buffalo. The tests to which they were put would be too severe on only a pasture diet.

PUNCHING BUFFALO

Civilization Has Not "Changed the Stripes" of This Rugged American—as an Authority Herewith Testifies

By John H. Hatton

Thus we were made ready for the very exciting job of punching buffalo—using the word "punching" in its present-day meaning of driving or wrangling cattle. It might be interesting to insert here that the word had its origin in the earlier shipments of cattle by train. Cowboys accompanying trainloads of cattle to the central markets and, incidentally, to the bright lights of the city, were provided with long poles. As a measure of compensation for their trip on the owner's cattle passes, they would inspect the cars at every stop and, with the poles, poke up any cattle that were down in the cars and in danger of being trampled to death. Thus the term "punching" cattle.

But to get back to punching buffalo, we entered the 7,300-acre pasture, enclosed by a high, woven-wire fence, through a strong gate equipped with a padlock. There were no animals in sight so we rode for a while, finally coming upon a great bull lying in a buffalo-wallow. He was panting from the heat and ready for combat, but our objective was the main herd hidden in the hills. We rode on. After several hours we found the herd grazing in solid formation, fighting flies. But there seemed to be no other excitement, and we actually drove them quite a distance nearer the gate leading to the corrals and stockade before things began to pop.

When within about fifty rods of the corrals we saw the ranger streak out at appalling speed in pursuit of a beautiful cow that had headed for the open. They were over the ridge and out of sight in less time than it takes to tell about it. She was too swift to head and the ranger returned, his horse lathered and with flanks heaving terribly. Others darted for liberty while we undertook to head and return them. Sometimes we succeeded, but as often we failed. The calves, seemingly as fleet as their mothers, would slap their fat little rumps with their short, quirt-like tails most amusingly when sorely pressed. It reminded me of a small boy astride a stick whipping himself and pretending he was a race horse.

The love of a matron buffalo for her precious offspring is something remarkable. Once a calf broke away by himself and the way that snorting, barking mother joined him was truly devotional. Also the large bulls, with self-appointed responsibility, have a way of inserting themselves between the unwelcome intruder and the smallest and shyest of the herd.

For more than two hours we fought back and forth to hold them from breaking. A few would get away in spite of all our horses could do, and we were making no progress toward the gate.

Finally, the ranger said, "There's no use fooling this way any longer. Let's charge them." And we did, cavalry fashion, like a mob of howling Indians. Our various impacts served only to make dents here and there in the great heaving, raving mass of rumbling, snorting flesh. Some of the milling, churning animals darted toward the open spaces and we were truly in for it to turn the leaders back. Simultaneously we about faced.

It looked hopeless. The ranger's assistant, in a terrible dash over an arroyo and flanked by two surging lines of leaping brutes, was thrown about fifteen feet headlong when his horse tripped and fell. Quick as a cat he regained his horse as it struggled to its feet and, remounting, continued the dash, actually succeeding in turning back his portion of the line. We brought them back with the loss of four or five, our horses for the moment spent. We were hot, tired and discouraged.

Again and again we tried to push them toward the gate which led into the pasture next to the corrals, meantime losing animals we wanted to hold. But we could make no progress. They would not move an inch farther in that direction. Finally we eased them down the line of fence towards another gate which opened into an adjoining field. Then slowly but surely we seemed to be getting control.

"Careful—steady—whoa, there—don't let those leaders dodge you!" shouted the ranger.

We held them this time and, in the milling, some nearest the gate went through. Then like the draining of a great black pool, the seething mass poured through the aperture.

We now had them in a small enclosure next to the lane that led to the corrals. The animals seemed to sense our objective and began milling furiously. Fixing on a splendid specimen and led by the ranger and his assistant, we charged with all the energy our steeds could muster and gradually edged two out and toward the lane.

"At them now! Don't give them the slightest chance to turn on you! Close in and gang up there!" The ranger barked orders with what little breath he had left. With ear-breaking yells and waving hats we forced them into the corral. Repeating the performance, we picked two more beautiful cows that the boys said had never borne calves.

Through the corrals to the crowding chutes and the crates standing ready on trucks, which each animal looks upon as an exit from captivity, they were made ready for the journey to the railroad and to their destination in Kansas—a credit to any celebration or barbecue, and well worth the $110 per head received for them. Let no one tell me that civilization has "changed the stripes" on our American buffalo.

CONSERVATION CALENDAR

Important Bills in Congress with Action
April 12 - May 12, 1939

BILLS ENACTED

H. J. Res. 246—Taylor, Colorado—Making a further additional appropriation for work relief and relief for the fiscal year ending June 30, 1939. Passed House March 31, 1939. Passed Senate April 11, 1939. Signed by the President April 13, 1939. Public Resolution No. 10.

H. R. 5219—Taylor, Colorado—Second Deficiency Appropriation bill. Passed House March 22, 1939. Passed Senate Amended April 17, 1939. Signed by the President May 2, 1939. Public Law No. 61.

H. R. 4852—Taylor, Colorado—Making appropriations for the Department of the Interior for the fiscal year ending June 30, 1940. Passed House March 20, 1939. Passed Senate April 17, 1939. Presented to the President for signature May 9, 1939.

APPROPRIATIONS

H. J. Res. 266—Coffee, Washington—Making a further additional appropriation for work relief and relief for the fiscal year ending June 30, 1939. Introduced April 13, 1939. Referred to the Committee on Appropriations.

H. R. 5269—Taylor, Colorado—Making appropriations for the Department of Agriculture and for the Farm Credit Administration for the fiscal year ending June 30, 1940. Passed House March 28, 1939. Reported with amendments (Report No. 386) by the Senate Committee on Appropriations May 5, 1939.

GOVERNMENTAL FUNCTIONS

H. Con. Res. 19—Taber—Opposing the Reorganization Plan Numbered 1, transmitted to Congress by the President on April 25, 1939. Rejected by a roll call vote in the House 265 to 128, May 3, 1939.

S. Con. Res. 16—Byrnes—Resolved by the Senate (the House of Representatives concurring) That the Congress does not favor the Reorganization Plan No. II, transmitted to Congress by the President on May 9, 1939. Reported adversely by the Senate members of the Select Committee on Government Organization.

NATIONAL FORESTS

H. R. 169—Izac—To facilitate the control of soil erosion and/or flood damage originating upon lands within the exterior boundaries of the Cleveland National Forest in San Diego County, California. Passed House May 1, 1939. Referred to the Senate Committee on Agriculture and Forestry May 2, 1939.

H. R. 1790—Elliott—To authorize additions to the Sequoia National Forest, California, through exchanges under the Act of March 20, 1922, or by proclamation or executive order. Reported without amendment (Report No. 499) by the House Committee on the Public Lands April 26, 1939.

H. R. 2009—Voorhis, California—To facilitate the control of soil erosion and/or flood damage originating upon lands within the exterior boundaries of the Angeles National Forest, California. Passed House May 1, 1939. Referred to the Senate Committee on Agriculture and Forestry May 2, 1939.

H. R. 2415—Englebright—To authorize the addition of certain lands to the Plumas National Forest, California. Reported with amendment (Report No. 510) by the House Committee on the Public Lands April 27, 1939.

H. R. 2417—Elliott—To facilitate the control of soil erosion and/or flood damage originating upon lands within the exterior of boundaries of the Sequoia National Forest, California. Passed House May 1, 1939. Referred to the Senate Committee on Agriculture and Forestry May 2, 1939.

H. R. 5747—Leavy—To authorize the addition of certain lands to the Wenatchee National Forest. Introduced April 13, 1939. Referred to the Committee on the Public Lands.

NATIONAL PARKS

H. R. 3759—DeRouen—To authorize a National Mississippi Parkway and matters relating thereto. Reported with amendment (Report No. 542) by the House Committee on the Public Lands May 4, 1939.

H. R. 4635—Englebright—To transfer certain lands from the Sierra National Forest to the Yosemite National Park in California. Reported without amendment (Report No. 519) by the House Committee on the Public Lands April 27, 1939.

TREE DISEASES AND INSECTS

H. R. 3406—Lea—For forest protection against the white pine blister rust. Passed House April 17, 1939. Referred to the Senate Committee on Agriculture and Forestry April 19, 1939.

WATER AND STREAM CONTROL

S. 685—Barkley—To create a Division of Water Pollution Control in the U. S. Public Health Service. Passed Senate amended May 1, 1939. Reported with amendment (Report No. 611) by the House Committee on Rivers and Harbors May 10, 1939.

WILD LIFE

S. 2270—Smith, S. C.—To authorize the Secretary of Agriculture to purchase refuge lands within the State of South Carolina for the perpetuation of the eastern wild turkey, etc. Reported with an amendment (Report No. 405) by the Committee on Agriculture and Forestry May 9, 1939.

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YOUR SHADE TREES

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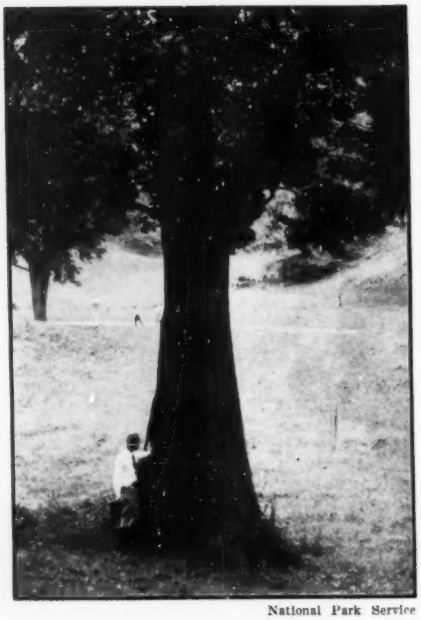
AN OUNCE OF PREVENTION



National Park Service

Proper treatment of small tree wounds will prevent the development of major ones, as shown above

IT IS my contention that most major tree wounds—probably ninety per cent—are preventable, and if you will reflect on the tree injuries you have observed, I think that you will agree with me. If a young tree is properly chosen for the site it is to occupy, if it is planted with some degree of care, pruned and trained to develop a strong branch structure, and watered, fertilized and sprayed at necessary intervals, there is no reason why the average tree should ever require major repairs.

Of course, even the finest shade trees occasionally suffer serious injuries and disfigurement through causes beyond human control, but it is safe to say that the majority of tree wounds can be traced to carelessness or ignorance.

The care which our trees demand starts even before they are planted in their permanent homes. In a recent article in this series, those points which enter into the selection of a tree for a particular site—soil, drainage, exposure, climate and other environmental factors—were considered in some detail so that additional discussion of these factors seems unnecessary at this time.

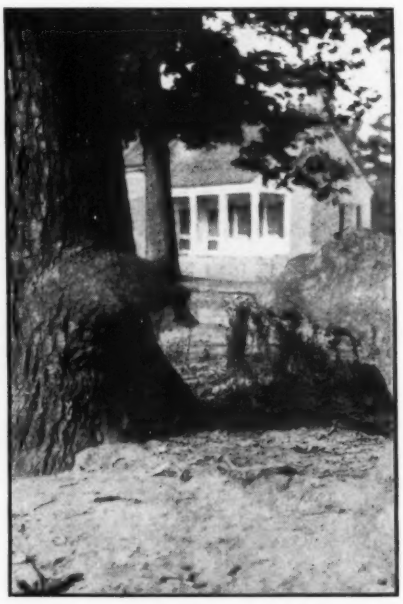
Certain other types of tree troubles—girdling roots, for example—may be avoided if the tree is carefully planted, making sure that it is firmly set at the proper depth in a prepared bed of good soil, with the roots spread out in a normal manner without cramping or twisting.

Many a tree has been ruined at this stage of its existence by guying or staking with wires bound tightly around the rapidly expanding stem. Small lag screws inserted into the tree—if the trunk diameter is sufficient—to which guy wires are attached, are preferable to guys which encircle the trunk, even if protected by a short piece of rubber hose. For a very small tree, a stout stake driven alongside and connected by a short piece of soft rope or burlap will do for support. But even this needs to be loosened occasionally to prevent constriction.

The development of a strong, well-spaced branch framework by means of judicious pruning is the next consideration in a program of wound prevention. Subsequent discussions in these columns will be devoted to the details of this important subject; suffice to say here that correct pruning should be directed toward the elimination of undesirable limbs and weak crotches before they reach any material size. Small cuts, made close to the trunk or parent limbs, properly painted, will heal quickly and thus prevent infection by closing the door to fungus spores.

There is no more important limiting factor of growth than adequate, but not superfluous, moisture. A vigorous tree is equipped by nature to withstand attacks by some insects and diseases, so if we are to prevent injuries from these agencies it behooves us to look to the moisture supply of our shade trees. A deep soaking when the ground is dry is preferable to frequent light sprinklings which tend to stimulate root development close to the soil surface where the tender rootlets are easily affected by drought and frost.

It is rarely possible to keep our trees entirely free from injurious insects and diseases but, while some are extremely difficult or even impossible to control, most of the commoner pests may be kept in check by suitable sprays. These have to be applied at the time when the attacking hordes of insects or disease spores are most vulnerable, however, and the tree owner will need to become acquainted with the pests prevalent in his neighborhood if his control efforts are to have maximum effect. Your state agricultural or forestry



Seats wedged between trees are pleasant to sit on but hard on the trees

National Park Service

Avoid wrapping wires and ropes around trees if you want them to remain healthy

experimental station will gladly give you information along this line.

One of the commonest causes of wounds in mature trees is from splitting limbs. Not all species of trees are equally susceptible to injury from this cause because of differences in structure. Those trees which develop V-shaped crotches are not infrequently injured by splitting, but those which develop U-shaped crotches are rarely subjected to injury from this cause because of the stronger structural arrangement of the woody elements. Even if your trees are of the former type there is no reason why damage cannot be prevented by bracing them with steel or copper cables placed high up in the crown and steel bolts through or just above the crotches.

Lightning is another important source of tree wounds; the severity of the injury presumably being dependent on the intensity of the stroke. There is no need to permit our trees to be destroyed or mutilated by this manifestation of nature, however, since lightning protection for trees is now a practical reality. Records collected by the writer indicate that something over 4,000 trees have been given lightning protection in the last twenty odd years and so far none has been injured by lightning.

The home builder is often his own worst enemy when it comes to tree injuries. Not infrequently he chooses the site for his new home because of the trees on the lot. Then he proceeds to dig his cellar, piling the excavated material around the trees; he then permits trucks to drive repeatedly over the root systems; he piles materials against trunks; he lays out walks and driveways, cutting off any roots encountered; and finally he winds guy wires around the trees to serve as supports for temporary derricks. Perhaps he even builds fires close to the trees to dispose of waste materials—and then wonders why the trees respond by developing serious wounds and injuries.

Isn't it sensible to protect trees by using a little judgment before the harm is done? Some damage, perhaps, is unavoidable, but considerable may be avoided in many instances by suitable precautionary measures. When conditions permit, the site for the house frequently may be changed slightly to avoid serious root cutting and barricades will keep trucks off the root systems and prevent damage by jarring, compaction and puddling of the soil as well as bruises on the trunks. Plans for walks and driveways, not infrequently, may be modified to prevent root cutting and, if care is used in digging service trenches, roots can be undermined instead of being severed. The contract with your builder should contain rigid specifications regarding these things as well as restrictions to prevent disposal of waste material by burning on the premises.

Even after the house is built and occupied, constant care will be needed to avoid tree injuries. When the final grading is done make sure that grades around trees are not changed appreciably or, if this is unavoidable, that suitable precautionary measures are taken to prevent root smothering; that clotheslines do not encircle trunks; that seats are not wedged between trees; that the boy who cuts the lawn does not bang the trunks with his lawnmower; and that any wounds which now exist are properly treated to prevent decay and promote healing. Remember, an ounce of prevention is worth many pounds of cure.

Leaf-Lore With Carbons

(*Continued from page* 309)

ripen their acorns in one season; the red oaks make less valuable lumber and mature their fruit after two years' growth. White oak leaves have rounded lobes with smooth tips, while the red oak leaf lobes have sharp points with bristly tips.

The common white oak, most abundant of its group and the most valuable commercially, has leaves varying from the deeply-cut form to one with broad lobes and narrow sinuses. The chestnut oak, its near relative, bears leaves resembling those of the chestnut tree, but with more rounded teeth. A leaf with three square lobes, forming a cross at its outer end, is typical of the post oak, so-called from its durability in fence construction, and this cross shape is so distinctive that the leaf is easily recognized. In the red oak group, the northern red oak has perhaps the handsomest of all our oak leaves, with its gracefully tapered triangular lobes separated by sinuses of similar form. The southern red oak or Spanish oak has the characteristic leaf shown in our print, with a long, parallel-sided, finger-like tip and a tapering, pear-shaped base, in addition to other leaf forms much less distinctive. Another tree of this group, easily identified in autumn by its flaming color and hence called the scarlet oak, has leaves distinguished by narrow lobes and very large sinuses. All oaks belong botanically to the beech family, which also includes the American beech, a delicate-leaved giant of our eastern woods, and the chestnut, whose sharply-toothed foliage seems doomed to disappear from American forests with the progress of the chestnut blight.

The leaves of our native maples, which contribute so much to the autumnal beauty of the woods by their brilliant color, have an equal beauty of form and make exceptionally attractive leaf prints. Extra heavy pressure in printing the red maple leaf gives us all of the intricate net-veined pattern of the leaf structure, while lighter rubbing will bring out only the primary veins. The birches have delicate, fine-toothed leaves, alternately placed on the twig, forming shapely sprays in keeping with their graceful habit of growth; the sweet birch leaf print is typical of the group. The American elm's spreading, pendulous branches have an alternately arranged foliage like that of the birches, but made up of much rougher, coarser leaves.

(*Continuing on page* 333)

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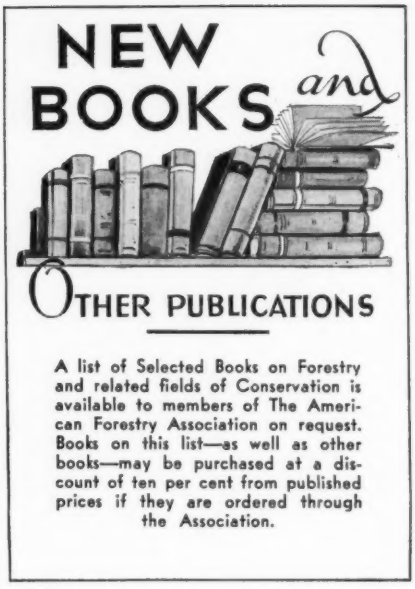


A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request. Books on this list—as well as other books—may be purchased at a discount of ten per cent from published prices if they are ordered through the Association.

ANIMAL NEIGHBORS OF THE COUNTRYSIDE, by Joseph Wharton Lippincott. Published by J. B. Lippincott Company, Washington Square, Philadelphia, Pennsylvania. 272 pages. 43 illustrations by Lynn Bogue Hunt. Price $2.50.

From the quick-footed cottontail to the grizzly bear, the author of this delightful book introduces us to those creatures which we are apt to encounter along the countryside—or even in our own backyards. Mr. Lippincott's writing shows a keen knowledge and love of wildlife obtained by his observations and personal experiences in the study of animal lore.

The pages of this book are charmingly illustrated by Lynn Bogue Hunt.

THE COLORADO DELTA, by Godfrey Sykes. Published jointly by the Carnegie Institution of Washington and the American Geographical Society, Broadway and 156th Street, New York City. 193 pages. Illustrated. Price $4.00.

With well chosen quotation and vigorous descriptions, this book details the early explorations of the Colorado River, the influence of the river on agriculture and the development of the Imperial Valley, and finally the origin and physical characteristics of the detrital load whose deposition has caused the great delta.

LITTLE LIVES—THE STORY OF THE WORLD OF INSECTS, by Julie Closson Kenly. Published by D. Appleton-Century Company, 35 West 32nd Street, New York City. 271 pages. Illustrated with line drawings. Price $2.50.

Julie Closson Kenly has chosen a unique subject and given it rare treatment. She has chosen to present her history of "bugs" in a style embracing scientific fact without embellishment or philosophical veering from truth, and yet has created an unusual collection of accredited, humorously written chapters depicting the mode of living of a variety of insects.

Forest Products Statistics of the Pacific Coast States, R. V. Reynolds and A. H. Pierson, U. S. Dept. of Agr. Statistical Bulletin No. 65. Supt. of Docs., Washington, D. C. Price 10 cents.

Field and Laboratory Technic in Wildlife Management, by Howard M. Wight. Apply Frank E. Robbins, Managing Editor, University of Michigan Press, Ann Arbor, Michigan. Price $1.50.

Inventory—An Appraisal of Results of the Works Progress Administration, by Harry L. Hopkins, Administrator. Supt. of Docs., Washington, D. C. Price 30 cents.

Experimental Feeding of Deer, Technical Bulletin 75, and *Control of Mesquite and Noxious Shrubs on Grassland Ranges,* Technical Bulletin 74, published by the University of Arizona, Tucson, Arizona.

Chicago Park District, Third Annual Report, 1937. Chicago Park Commission, Burnham Park, Chicago, Illinois.

Strip Cropping for Soil Conservation. Farmers' Bulletin 1776, U. S. Dept. of Agr., Supt. of Documents, Washington, D. C. Price 5 cents.

Officials and Organizations Concerned with Wildlife Protection, 1938. Compiled by Frank G. Grimes, Biological Survey, Dept. of Agr., Misc. Pub. No. 329. Supt. of Documents, Washington, D. C. Price 5 cents.

Decisions of the United States Board on Geographical Names, July 1, 1937-June 30, 1938. Dept. of Int., Supt. of Docs., Washington, D. C.

Bird-Lore's Thirty-ninth Christmas Bird Census—Edited by Margaret Brooks and published by National Assn. of Audubon Societies, New York City.

The Water-Culture Method for Growing Plants Without Soil, by D. R. Hoagland and D. I. Arnon. University of California College of Agriculture Cir. 347, Berkeley, Cal.

Federal Relations to Research—National Resources Committee. Supt. of Documents, Washington, D. C. Price 10 cents.

Forest Resources of Central Georgia. Progress Report of the Southern Forest Survey. Southern Forest Expt. Station, New Orleans, La.

Forests Protected by the CCC. Forest Improvements by the CCC and Reforestation by the CCC—from the Forestry Division of the Civilian Conservation Corps. U. S. Government Printing Office, Washington, D. C.

Directory of Forest Products Industries in Massachusetts, covering the counties of Berkshire, Franklin, Hampden, Hampshire, and Worcester. Others are in preparation. Department of Conservation, 20 Somerset Street, Boston, Massachusetts.

Growing Plants Without Soil, by Dr. Stuart Dunn, in "QUEST"—covering science, nature, medicine, etc., and published at Wellesley, Massachusetts. Price 25 cents.

Leaf-Lore With Carbons

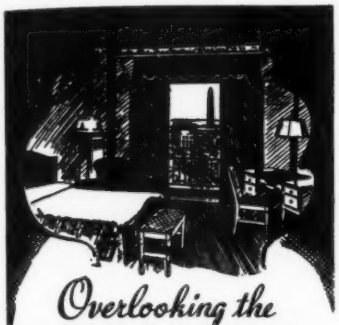
(*Continued from page* 331)

Nearly all tree flowers are inconspicuous or take the form of cones or catkins. A lovely exception to this rule is the tulip tree, which produces beautiful tulip-shaped blooms of a pale yellow color, striped with green and orange. This is the tree often miscalled the yellow poplar, but it belongs to the magnolia family and is not even distantly related to the true poplars. Trees with compound leaves like those of the mockernut hickory produce them in such a variety of sizes that it is easy to find one of proper size for our printing tablet. Such a leaf is called "compound" because it is made up of several leaflets on a common stem, all shed as a unit when the leaves drop off in the fall. Another type of compound leaf is that of the sweet buckeye, which is palmately compound—like the fingers of a hand—instead of pinnately compound—like the vanes of a feather—as is the hickory leaf.

The spiny foliage of the cone-bearing evergreens, such as pine, spruce and cedar, does not lend itself to carbon recording. It will be found, however, that a careful print of their leaves will give an impression showing the run of the twigs and the tips of the needles.

Among the leaves that shade our city streets, perhaps the most remarkable is that of the ginkgo tree, often called a living fossil, since it is a tree of the Ice Age, no longer growing wild, but preserved down through the centuries through planting around ancient Chinese temples. The ginkgo has existed essentially unchanged for perhaps ten million years, or probably for a longer period than any other living tree. It is unique botanically, as it belongs to the same group as the cone-bearing evergreen trees, yet sheds its leaves and does not bear cones; the leaves are unusual in being fan-shaped and palmately veined.

This sort of leaf-lore with carbons is not suggested as a royal road to complete knowledge of the trees, for it can never help us to recognize them in their winter undress, when the friendly leaves no longer offer their ready aid to identification. A collection of leaf prints, however, requires so little special talent and equipment for its production, and forms such an effective aid to memory, that it is recommended as an excellent first step toward a better acquaintance with these good neighbors of the woods. When you find yourself unable to name with assurance even the commonest trees about you, why not take home specimens of their leaves for printing, to be identified later at your leisure, with the aid of a good handbook? If you do, you will soon discover that you have made a host of valuable and permanent friends, who will always be waiting to greet you, wherever you may roam in the great world of Nature's outdoors.



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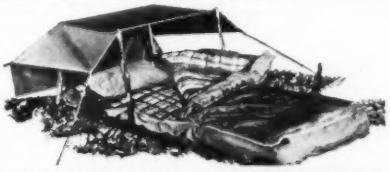

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THE AMERICAN FORESTRY ASSOCIATION

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Cabin Fever

(*Continued from page* 305)

be adapted to the site, harmonize with the setting and in general "fit the ground."

Log construction is preferable, and usually a permit for house logs can be secured from the forest ranger at nominal cost. But don't jump to the conclusion that such construction is cheap merely because the initial cost of house logs is low. Usually high quality house logs are obtainable only at points quite distant from the proposed cabin site. Cost of cutting, hauling, peeling and finishing such logs often amounts to more than the cost of milled lumber. Besides, men who really understand log construction are hard to find.

If possible, use materials native to the locality. Variations from the regular log house can be had by use of peeled, sawed or hewed logs, or slab siding. Sawed lumber buildings may be quite suitable in some cases. Unplaned lumber is generally better than planed, stained finish better than painted. Use neutral-toned stain or finish such as sienna brown, burnt umber, or weathered gray.

Where local stone can be economically used, it will usually be satisfactory. Bright colored mortar in masonry work is out of place in the usual scheme of forest color. Brick, cement, stucco and similar materials are likewise undesirable. Corrugated iron, exposed tar paper siding or roofing, unstained or unpainted sawed lumber are prohibited within the national forest boundaries.

Building design for good forest cabins necessarily varies greatly from that utilized in city homes. A structure surrounded by forest trees and shrubs presents problems in no way akin to those common to dwellings facing a street and hemmed in by houses of contrasting design.

Foundations, for the better cabin, should be kept as inconspicuous as possible. Pillars are inferior to a wall foundation and where used should be ample in number and substantially made. Where exposed to view, foundations should be of rock masonry rather than cement. Foundations, while kept as low as possible, must be at least twelve inches above ground.

Walls should present clean, pleasing surfaces, and the various wall areas of a building should keep some geometrical relation to each other. Avoid having any portion of a building having appearances of being "stuck on." Windows and doors should be of uniform shape and should be placed with relation to each other so that the result will be balanced and pleasing. Large blank wall surfaces should be broken up, if possible, with windows or a door.

In most summer homes the fireplace is the dominant feature. Many such structures have been built around the hearth. No other phase of cabin construction offers such possibilities for the builder to display his skill and artistic touch. Where stone is available—as it is in most mountain localities — only good design and good workmanship are needed to insure both a beautiful and serviceable fireplace. It is well, however, to study a few satisfactory fireplaces before attempting to build one. Nothing can deal more downright misery than a fireplace that refuses to draw properly. The matter of draught is of primary importance and must be taken into consideration before actual construction is started.

The matter of roofs for the summer home should be carefully watched. Slopes of various roof areas should be consistent. Broken ridges and valleys should be avoided. Strive for uniform pitch. Shingles or shakes are most suitable for roofing cabins. A good grade of composition shingle is permissible. Avoid roll roofing, tin and similar unpleasing materials.

If you plan to have a porch, be sure that it fits the cabin. Some excellent summer homes have been spoiled in appearance by careless porch design. Avoid log porches on frame structures, or vice versa. Keep in mind, too, that the foundation of a porch is equally as important as that of the house.

Chimneys must be fire-proof and tile lined. A stove pipe through the roof may rid the cabin of smoke, but it will never pass Forest Service inspection. Some excellent chimneys can be built of native stone. Although brick is far less adapted to natural settings, its use is allowed. A pleasing appearance is often achieved by building the fireplace and chimneys of the same or similar materials.

Above all, avoid excess decoration in the construction of a summer home. Keep it simple! Gingerbread work, scroll work, or curlicues of any kind are unsuited to the forest residence.

Toilets and garbage pits must be fly-proof. Within the national forests they must be located as staked out by the local forest officer. These officers also furnish, upon request, excellent designs for such structures. If your cabin site happens to be outside the forest boundary remember to keep all toilets and garbage pits a safe distance from running streams or other bodies of water. Stream pollution is a serious menace to public health.

Many forest cabins are so charmingly located that little is necessary in the way of landscaping. Others possess in the surrounding trees and shrubs the nucleus of a beautiful yard. In forest landscaping, one rule in inflexible—*work with nature.* Never let the treatment become complex. Formal gardens have no place in the woods.

Preserve the native rocks, shrubs and

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Fred C. Knapp, Portland, Or.
BUYS AND SELLS
Western Timber Lands

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trees and endeavor to work them into the plan. Additional plantings should be of native plants or of those closely resembling the native ones. Purely naturalistic rock gardens and pools add charm to the cabin site, but watch closely not to over-do this. Shun the use of loud colors, such as white-washed rocks, fancy painted lawn furniture and ornate entrance portals. Rustic furniture is satisfactory if well made, otherwise it strikes a sour note in the harmony of things.

By judicious use of trees, both conifers and broadleaf varieties, and shrubs of varying height, some fine landscape effects can be secured. Keep in mind, however, that in most cases the natural landscape is difficult to improve upon. If planting is contemplated, the nearest forest office will gladly furnish the names and descriptions of trees and shrubs that are native or best suited to the locality. However, never transplant forest plants during the growing season. Choose the plants you wish to move and then mark their location with stakes. In early spring or late fall plants can usually be moved with far greater success than during the period when they are in leaf.

Often the use of high shrubs and trees to screen outbuildings and fences is very satisfactory. Medium and low shrubs make good ground cover and can well be utilized in screening foundations. In all cases strive for a balanced effect.

Roads, walks, paths and trails should fit into the terrain. Flagstones or gravel are best for walks or paths. Brick or cement walks do not fit a forest atmosphere.

Fences and gates should be avoided if possible. When necessary, they should be of native material and of utmost simplicity. The two-pole fence is well adapted to summer home use. A painted fence, especially white or bright colored, is startlingly artificial in an otherwise natural background. Peeled poles, stained brown, ordinarily fit into the surroundings better than do other types.

In general, good landscaping at summer homes depends largely upon nice adaptation of the house to the terrain and to natural surroundings. Such factors must be taken into consideration when the cabin is designed—before actual construction is under way.

Remember always that a tree or shrub cut down is not soon replaceable. Too much zeal with an ax can spell disaster. A few years ago a camp ground was laid out on a western forest. The spot was chosen because of the sheer beauty of its trees and low shrubs. One morning the foreman in charge handed an ax to a workman, fresh from the city, instructing him to clear out the brush. The workman accepted his orders literally and proceeded to cut thoroughly — so thoroughly that when the foreman returned at evening he found every shrub cut and all tree branches lopped off to an even six foot height. The site had to be abandoned, for the very shrubs which had made it so attractive had fallen before a too ambitious ax.

WHO'S WHO
Among the Authors in This Issue

Aldo Leopold

ALDO LEOPOLD (*The Farmer as a Conservationist*), who is an outstanding figure in the field of conservation, is professor of wildlife management at the University of Wisconsin. Graduating from Yale, he served sixteen years in the Forest Service, four of them as associate director of the Forest Products Laboratory. He resigned to undertake a survey of game resources for the Sporting Arms and Ammunition Manufacturers' Institute. Later Mr. Leopold served with that organization in a consulting capacity before affiliating with the University of Wisconsin.

CLELAND VAN DRESSER (*Rivers of Oblivion*) is a free-lance writer. Beginning newspaper work in Los Angeles, he has since come to Washington. A good proportion of his writing is on some phase of conservation.

CLYDE BRUNDY (*Cabin Fever*) was born in Greeley, Colorado. Associated with the Forest Service in Wyoming and Colorado, he spends his spare time riding, fishing—and writing stories and articles with the color and zest of the West in which he was reared.

HARRY BOTSFORD (*Little Lost Lakes*) has in turn been oil field worker, bridge builder, wood chopper, bank employee, soldier, writer, editor and advertising and publicity writer. His biggest thrill came when he *accidentally* sold an article—and his second thrill when he *intentionally* caught a prize bass on a five ounce fly rod.

GEORGE C. MASON (*Leaf Lore with Carbons*), born in Chicago, has been ship draftsman, naval architect, hull estimator, and forester for The Mariner's Museum at Newport News. He is also a noted lecturer on birds, trees, ferns and wildflowers.

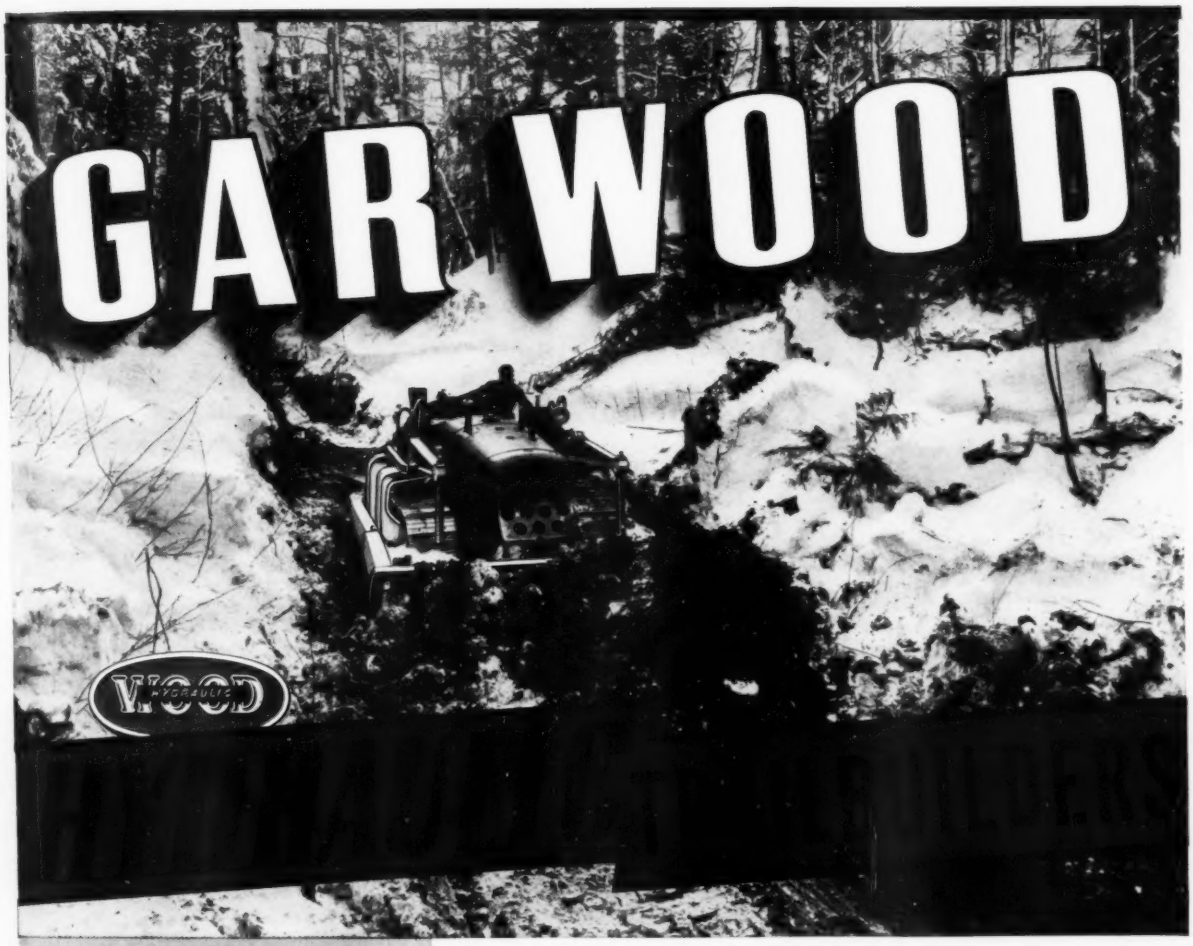
C. H. HAMMAR and A. H. MUSSMAN (*Providing Credit for Forest Restoration*) are land economists with a natural interest in forestry and forest credit. Dr. Hammar is Professor of Agricultural Economics at the Missouri College of Agriculture, and Mr. Mussman is with the Bureau of Agricultural Economics.

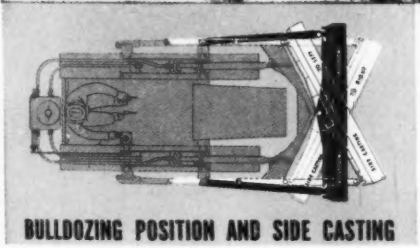
G. H. COLLINGWOOD (*Eastern Cottonwood—Tree Series*) is forester for The American Forestry Association.

A. ROBERT THOMPSON (*Your Shade Trees*) is in charge of shade tree work with the branch of forestry of the National Park Service.

COVER—"Trout Casting." Photographed by John Kabel on Two Medicine River, Glacier National Park, Montana.

GAR WOOD





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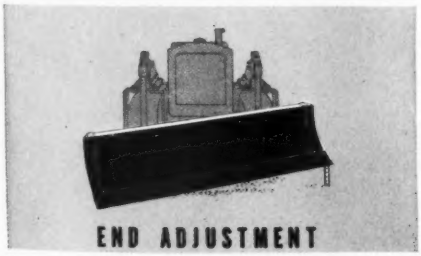

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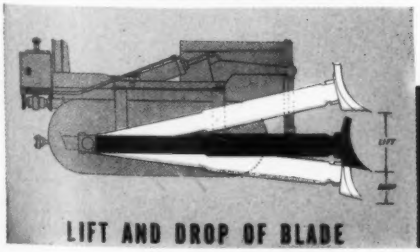

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